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ON *the afternoon of* 10 *August* 1628 *the Swedish man-of-war* Vasa *was being warped from her berth and getting under way. She had just taken on board all of her guns, munitions, and supplies and the new hundred-and-seventy-foot ship moved slowly under topsails and mizzen before a light southwesterly breeze out from behind the lee of the high rocks that shelter the southern shore of Stockholm Harbor. As the fresh wind struck her suddenly she heeled over, capsized, and sank in eighteen fathoms of water.*

Why did this fine new ship capsize? An immediate series of inquiries was held to look into the cause of the disaster. There is no doubt that she was a very unstable vessel. She was unusually narrow and had not been given sufficient draft and correspondingly greater ballast to compensate for her leanness. Commodore Edward Clason, who has recently sent out a release on her salvage, thinks that she may have been an experimental ship; an attempt to get a faster, more heavily armed man-of-war. Obviously she was a failure.

Gradually the memory of the disaster disappeared and, aside from an occasional mention of her in books of Swedish naval history she was not thought of again for over three centuries. In 1956 *Mr. Anders Franzon of Stockholm, who has been interested in locating naval wrecks for many years, took up the search for* Vasa. *He located the big oak hull lying on the bottom, silted up to the lower gun ports but still standing fifteen to twenty feet out of the mud. In September* 1958 *a twenty-four-*

pound bronze gun was raised from the wreck which proved beyond any doubt that she was the new seventeenth-century warship that went down on her maiden voyage. Now slowly and carefully preparations are being made to raise Vasa. *Evidently the ship is in a remarkable state of preservation. Many guns and handsome wood carvings have already been brought to the surface. When she is finally raised and preserved she will be the most important example of seventeenth-century naval architecture in existence, the only ship to be seen dating from that great period of sail.*

It is a fitting coincidence that this same year the Statens Sjohistoriska Museum of Stockholm is reprinting from the original plates Fredrik Henrik af Chapman's Architectura Navalis Mercatoria *originally published in* 1768. *The sixty-two original plates each contain construction drawings of one or more vessels with tables and dimensions in Swedish, English, and French text. The copperplates of the work were engraved by af Chapman's nephew, Lars Bogeman, the most promising of the master's pupils and co-workers. This new edition of a basic and unique work on naval architecture is limited to thirty copies and is available bound for* 2,000 *or unbound for* 1,800 *Swedish crowns.*

Our friend, R. C. Anderson, has recently drawn my attention to a worthy project being sponsored by the Society for Nautical Research. There is preserved in the famous subtropical gardens of Tresco Abbey a remarkable collection of figureheads and other relics of ships wrecked on the Isles of Scilly. The material was accumulated by successive generations of the Dorrien Smith family who have been tenants in the Duchy of Cornwall since 1835. *This unusual collection came from about forty shipwrecks dating from the eighteenth to the twentieth centuries and is a unique and moving record of tragedy at sea and a valuable collection of material for any nautical-minded student. The collection today is known as the Tresco 'Valhalla' and the Society is attempting to raise a fund of two thousand pounds to be added to grants already received for the restoration, rehousing, and preservation of this important collection. Anyone interested in this worthy cause should send his contribution to the Valhalla Fund, care of the Secretary, Society for Nautical Research, National Maritime Museum, Greenwich S.E.* 10.

Peabody Museum of Salem ERNEST S. DODGE

The American Navy at Work on the Brazil Station, 1827-1860

BY DONALD W. GIFFIN

BETWEEN the War of 1812 and the Spanish-American War, except for the period of the Civil War, the most important function of the United States Navy was the protection of American foreign trade by naval squadrons established on distant stations. In the era of expanding international commerce which followed the disruptions of the Napoleonic wars, the United States Navy spread its small resources over the seas of the world. The Mediterranean squadron was reconstituted after the war in 1815; the Pacific squadron was added in 1821, and in succession there followed the creation of the West Indian squadron in 1822, the Brazil squadron in 1826, the East Indian squadron in 1835, and the Africa squadron in 1842.[1]

For many years the squadron on the Brazil station was one of the busiest in the navy. It protected American trade in an area where it early attained significant value and continued to grow in importance. In 1825, exports from the United States to Argentina and Brazil were valued at $2,860,911, and imports from those countries were worth $2,434,884. By 1850 these figures had risen to $3,806,393 and $11,974,290 respectively.[2] In addition to guarding American interests on the east coast of South America, the squadron's headquarters at Rio de Janeiro was a port of call for naval vessels on their way to and from the Pacific and East Indian squadrons. Though the Brazil squadron was only for very short periods among the largest in the navy and perhaps was never the most important, the history of its activities spread over many years in relatively peaceful waters helps to show clearly how that work of the navy was executed.[3]

[1] Allan Wescott, ed., *American Seapower Since 1875* (Chicago: J. B. Lippincott, 1947), pp. 91-95.

[2] W. S. Robertson, *Hispanic American Relations with the United States* (New York: Oxford University Press, 1923), pp. 197-204.

[3] This paper is based primarily on information drawn from three sources: U. S. Dept. of the Navy, Office of Naval Research, 'Letters Received by the Secretary of the Navy from Commanding Officers of the Squadrons, 1841-1886, Brazil Squadron, 1841-1861' (microfilm copies prepared by the National Archives), hereinafter cited as LCOBS; U. S. Dept. of the Navy, Office of Naval Research, 'Cruises and Squadrons off the Coast of Brazil,' hereinafter cited as Cruises; U. S. Dept. of the Navy, Secretary of the Navy, 'Annual Report,' 1826-1861.

The squadron was created in 1825 in response to increasing demands from American merchants who were trading in the newly independent nations of Brazil and the Argentine Republic.[4] War had broken out between those two countries in 1825 with the control of the Banda Oriental (present-day Uruguay) as the chief issue. Interference with American commerce had arisen when the commander of the Brazilian naval forces proclaimed a blockade of the whole coast of Argentina. Although the Argentine government had no navy at all, the Brazilians did not possess sufficient naval strength to enforce their blockade effectively over so large an area.

At this juncture Captain Elliott, the commander of the sloop *Cyane,* the first ship permanently attached to the squadron, arrived in the Rio de la Plata. He protested at once that the Brazilians were maintaining nothing more than a paper blockade.[5] Such a policy violated the principle of blockade which the United States had been endeavoring to establish. Elliott had been reminded of the American position in his orders from the Secretary of the Navy which contained this statement: 'Such places only are to be considered blockaded as are "attacked by a Belligerent force capable of preventing the entry of the Neutral." '[6] The American commander sought to preserve the greatest possible freedom of action for American merchantmen, while at the same time respecting the rights of the combatants. He succeeded in obtaining a more realistic interpretation of the Brazilian blockade policy and thus restored freedom of access to much of the Rio de la Plata to American ships. The first ship in the squadron had been ordered to the Brazil station in 1825 and by the middle of the succeeding year had proved its value to American commercial interests.

The war between Brazil and the Argentine Republic was settled in 1828. Peace, however, did not come to the Rio de la Plata. Conditions remained unsettled as the nations there sought to establish stable governments. The situation was further complicated during the late thirties when a dispute arose between Juan Manuel Rosas, dictator of Buenos Aires, and the commander of the French squadron stationed there. In 1838 French efforts to blockade Buenos Aires almost precipitated an open clash between French and American ships, but in the end cool heads prevailed.[7] Difficulties between France and the Latin American nation con-

[4] U. S. House of Representatives, *Executive Documents,* 20th Cong., 1st Sess., Doc. 212.

[5] Great Britain, Foreign Office, *British and Foreign State Papers* (1841-19—), Vol. 13, p. 824.

[6] 'Cruises,' O.S.W., No. 16, 23 March 1825-16 Aug. 1826, p. 420.

[7] John F. Cady, *Foreign Intervention in the Rio de la Plata 1838-1850* (Philadelphia: University of Pennsylvania Press, 1929), p. 58.

tinued until 1842 when pressing problems elsewhere forced France to relax her pressure on the Rosas government.

France had, in the meantime, persuaded the government of Uruguay to join in her efforts to topple Rosas. By this act France laid the basis for a period of sporadic fighting between the neighbors which was to last another decade. While interference with American trade was only an occasional occurrence, the unstable conditions there forced the commander of the squadron to keep at least one ship stationed in the Rio de la Plata. Most of the incidents which arose concerned differences in interpretation of the rules governing blockades. The American commanders sought to respect the rights of the nations in the region while protecting American commerce. The prolonged difficulties in the Rio de la Plata were in large measure ended in 1852 by the defeat of the Rosas government. Hostilities between Argentina and Uruguay were halted. This marked the end of any serious interference with American commercial activities there, though internal instability in both nations did necessitate the landing of United States marines for brief periods to protect American lives and property.[8]

The most spectacular example of protecting American commercial rights came about because of the irregularities of the government of the Paraguayan dictator, Carlos Antonio Lopez. Lopez had proclaimed his country open to foreign investors and several Americans had gone into business in Paraguay. Once the businesses had been firmly established, the dictator reversed his policy and, in effect, began confiscating the property of the foreigners. A crisis in American-Paraguayan relations was precipitated when a Paraguayan fort fired on the United States ship *Water Witch* while it was charting the Paraná River. The legality of actions taken by the Paraguayan government with regard to the American businessmen remains a matter of some debate. However, the firing on *Water Witch* was unjustifiable and was considered an insult to American national honor. Despite the clear provocation provided, the reaction of the United States government was out of proportion and perhaps was dictated by domestic considerations. President Buchanan ordered the Brazil squadron enlarged to fifteen ships and 2,200 sailors and marines. This fleet assembled in December 1858 and sailed up the river for Asunción to force the willful dictator to be more coöperative. The arrival of two of the vessels at the Paraguayan capital was sufficient to make Lopez conciliatory. New treaties were signed between the two nations guaranteeing American commercial rights and removing the blot on our es-

[8] Forrest to Sec. of the Navy, 15 Feb. 1858; Steedman to Sec. of the Navy, 18 Nov. 1854. LCOBS.

cutcheon. The Brazil squadron was then reduced to its normal size.[9]

The activities of the squadron were not limited to the Rio de la Plata. The orders given to Captain Elliott stated that he was to cruise 'on the eastern coast of South America from the neighborhood of Pernambuco to Montevideo.'[10] Requests for the ships of the squadron to visit various ports to 'show the flag' were numerous, for American diplomatic representatives felt that the symbol of American strength provided by the warships had a salutary effect on local authorities. Difficulties of communication coupled with the rather tenuous control exercised by the central governments made this measure necessary. Ships of the squadron called at various times on the ports of Bahia, Pernambuco, Rio Grande, Desterro (Florianópolis), Santos, Río Negro and the Falkland Islands. The squadron twice sent ships to call at ports on the coast of Africa. On one of these voyages, a cruise around the Cape of Good Hope to Madagascar and the Portuguese settlements on the east coast, there occurred the only loss of a ship which the squadron incurred during its thirty-five-year history. The sloop *Concord,* while sailing along the African coast, went aground on an uncharted bar at the mouth of the Lorango River. Fortunately, only three lives were lost though the ship was almost a total loss, only its rigging and stores being saved.[11]

In 1842 a change in American policy with regard to the slave trade caused an addition to the responsibilities of the Brazil squadron. Certain American shipbuilders and a number of American merchant seamen and officers carried on a flourishing business in providing ships and crews for the slave trade between Africa and Brazil. The squadron was ordered to enforce American laws prohibiting citizens from participating in the trade. Intercepting the slavers was a difficult job at best and in the circumstances under which the American naval commanders operated it was well-nigh impossible. The very magnitude of the area was completely out of proportion to the size of the forces at hand to patrol it, for the squadron usually consisted of only two ships. Furthermore, conditions in the Rio da la Plata necessitated stationing one ship there which, because of the sailing conditions, had to be a shallow-draft ship. To the flagship of the squadron, in most instances a frigate, fell the duty of hunting the slave ships. The size and speed of the frigates made them unsuited to cope with the smaller, faster and more maneuverable slavers. The commanders of the squadron requested in many of their reports that their force be

[9] U. S. House of Representatives, House Report No. 365, 35th Cong., 1st Sess., and LCOBS, 9 Sept. 1858-16 May 1859.

[10] 'Cruises,' O.S.W. No. 16, 23 Nov. 1825.

[11] Gardiner to Conover, 21 Dec. 1842. LCOBS.

enlarged. The United States government, however, was not sufficiently interested in suppressing the slave trade to make the expenditures necessary to enlarge the squadron, and the requests of the commanders remained unfulfilled. The activities of the squadron had little effect on the operations of the slave trade.

The Navy Department in creating the Brazil squadron had ordered it to protect American interests on the east coast of South America between Pernambuco and Montevideo. This assignment was gradually expanded until 1843 when the Secretary of the Navy stated that the squadron was responsible for the area 'from the mouth of the Amazon to Cape Horn, along the equator eastward to the southwestern boundary of the African station, Cape Negro; thence along the coast of Africa to the Cape of Good Hope.'[12] In carrying out his assignment in this huge area, roughly 17,000,000 square miles, the commander of the squadron also had to solve the routine administrative problems which arose, such as the disposition of the ships under his command, provision for an adequate supply of personnel, maintenance of good relations between the men of his command and the local governments, maintenance of adequate supplies of food and naval stores, provision for the repair of his ships, and administration of the naval storehouse at Rio de Janeiro. To appreciate the problems involved in administering the squadron, one must consider them in terms of the conditions which existed then, *e.g.*, the types of ships available, the meaning of the distances on the station and the evolution of political institutions in the United States and the countries on the station.

The squadron varied in size, though during the first thirteen years after its founding it usually consisted of two or three ships. The flagship of the commanding officer was most often a frigate mounting forty-four guns and the companion ship was usually a sloop mounting eighteen to twenty-two guns or a brig with twelve guns. With the developing tension between France and the Rosas government between 1839 and 1842, the squadron was enlarged to six ships—a seventy-four-gun ship of the line, a forty-four-gun frigate, three eighteen-gun sloops and a twelve-gun brig.[13] When the French withdrew their pressure and the stalemate developed in the siege of Montevideo in the conflict between Buenos Aires and Uruguay, the squadron was again reduced to two or three ships until 1858-1859 when it was enlarged briefly for the Paraguay expedition.

[12] U. S. Senate, Senate Documents, 'Annual Report of the Sec. of the Navy,' 28th Cong., 1st Sess.

[13] It is interesting to note that the British squadron at Montevideo in the 1840's consisted of two 50-gun ships, two 44-gun ships, three 26-gun ships, one 20-gun ship, seven 16-gun ships, six 10-gun ships, thirteen smaller vessels, and two steamers. Morris to the Sec. of the Navy, 20 May 1842. LCOBS.

Almost without exception, the officers commanding the squadron made two complaints about the ships provided for their command. First, there were not enough. This might be written off as simply as 'empire building' on the part of the commanders. Considering the vast area in question and the important duties assigned, however, the requests do not seem unreasonable. It must be remembered, also, that the voyage between Rio de Janeiro and Buenos Aires required about fourteen days' sailing and a cruise from the United States to Rio de Janeiro anywhere from forty to seventy days. The second complaint was that the ships provided did not include the classes most useful on the station. The chief deficiency was the lack of shallow-draft sailing or steam ships.[14] There were no deep-water ports in the Rio de la Plata at that time. At Montevideo all ships larger than sloops had to lie at anchor in the roads off that city, while the entrance to Buenos Aires was so silted up that naval ships had to anchor four to seven miles away from the city depending on their draft. On the Brazilian coast also there were ports which were too shallow for the ships assigned to the squadron. On several occasions navy ships attempted to enter the port of Rio Grande but were unable to complete their mission because of the bar at the mouth of the harbor.[15] As mentioned above, effective efforts to suppress the slave trade required smaller ships which could pursue the slavers into the shallow waters along the Brazilian coast where illicit slave stations were maintained. Furthermore, the smaller ships were better adapted in speed and maneuverability for trailing the slavers.[16]

While no inclusive generalization can be made about the distribution of the ships by the various officers commanding the squadron, a summary of the information in the commanders' reports seems to show that the flagships tended to divide their time between Rio de Janeiro and Buenos Aires. Because Rio de Janeiro was the headquarters of the squadron, they spent a little more time there than in Buenos Aires. The other ship was almost always stationed in the Rio de la Plata because of the continuous hostilities there. This ship was usually a sloop or brig, the smaller ships being better adapted to sailing conditions there.

As far as can be determined the ships of the squadron spent a large

[14] McKeever to the Sec. of the Navy, 11 May 1851. LCOBS.

[15] Wilson to Morris, 21 Mar. 1842. LCOBS.

[16] The first and only steamer assigned to the squadron up to the time of the Paraguay expedition was *Alleghany* which was part of the squadron for six months—April-October 1848. *Alleghany* was assigned to Rio de Janeiro for a special mission and was then assigned to the Mediterranean squadron over the protests of Commodore Stover, who was commanding the squadron at the time. U. S. Senate, Executive Documents, 'Annual Report of the Secretary of the Navy,' 30th Cong., 2nd Sess., Doc. 1; Storer to the Sec. of the Navy, 26 Oct. 1850. LCOBS.

percentage of their time in port. In accounting for this Commodore McKeever wrote the Secretary of the Navy that: 'The smallness of the Squadron will, however, in a great measure, prevent cruising at sea, except as far as it may be absolutely necessary, in going from port to port; —for I find that our public agents as well as our merchants are always desirous of the presence of one of our men-of-war, as highly conducive to the promotion of their great interests.'[17]

Life on the Brazil station was replete with frustration and disappointment for the officers, as any peacetime duty in the armed forces is likely to be, though there were compensations which somewhat balanced the scales. Duties of the officers, in most instances, were not arduous and when a ship was in port there were frequent opportunities to spend time on shore. Dr. Horner, who was the fleet surgeon during the early forties, recounts in his fascinating, though somewhat morbidly titled book, *The Medical Topography of Brazil . . .*,[18] many tales revolving around his experiences in the social life of Brazil. He speaks of attending several imperial receptions and of parties in the homes of some of the leading families. By his own admission he maintained close relations with several of the local belles. That all the officers in the squadron had experiences similar to Horner's is unlikely, but that many did is probable. Derelictions by the officers of the squadron were rare. Two or three instances of habitual drunkenness appeared in the reports of the commanders, and a few instances of clashes of personality were serious enough to be mentioned.[19]

The life of the officers offered some satisfactions to offset the boredom and frustration, but it is difficult to find such balance in the life of the seamen. In these years the navy was handicapped in recruiting by the effect of the vicious cycle of a brutal life at sea discouraging the enlistment of capable, reliable men and the resultant low quality of personnel leading to stricter and harsher discipline. One important step toward remedying this situation occurred in the 1840's when flogging was abolished. Commodore McKeever reported, in answer to a query from the Department, that the abolition of this punishment had in no way diminished the 'discipline, morale, or efficiency' of his ship. Further remarks which he made in the same report, however, are revealing of the thinking of the officers of that day. McKeever complained about the low quality of the

[17] McKeever to the Sec. of the Navy, 10 March 1851. LCOBS.

[18] G. R. B. Horner, *The Medical Topography of Brazil and Uruguay with Incidental Remarks* (Philadelphia: Lindsay and Blakiston, 1845).

[19] Mercer to the Sec. of the Navy, 29 July 1856. LCOBS.

men enlisted in the navy and recommended that those found to be incorrigibly unfit for duty ought to be marked with a tattoo.[20]

In addition to the need for obtaining good seamen, there was the need for obtaining a sufficient number of seamen. The normal length of the cruises of naval vessels was three years, but since it was usually impossible to enlist a full crew all at one time, ships frequently went to sea with a considerable portion of their crew having enlistments which would run out three to twelve months before the scheduled end of the cruise. The sailors had the right to demand their discharge when their enlistments expired even though this meant discharging them in a foreign port. The commander of the ship then was faced with three courses of action and each was used at various times on the Brazil station. First, the commander could arbitrarily extend the enlistments. This course was sometimes necessary, though the results were not uniformly beneficial. Very often the crews became intractable and on occasion insubordinate. The letters of the commanding officers of the station mentioned, on occasion, that several members of the crew had grown restive because their enlistments had expired. The situation became so serious on *Independence* in 1839 that Commodore Nicholson wrote that 'the men are in a state of great excitement and insubordination, many of them having refused to do duty. One of the ringleaders had been brought to a Court Martial which decided that it would be irregular to punish him.'[21] Second, the captain of a vessel could run shorthanded with the obvious dangers involved in that practice. Third, he could recruit replacements from among the seamen available in the ports on the station. The quality and quantity of seamen available there depended largely on the state of hostilities around the Rio de la Plata. In times of peace the supply of American seamen was sufficient to fill the needs of the squadron. In other times the naval officers were forced to enlist foreigners. The Secretary of the Navy complained in his annual report in 1828 that these foreign seamen 'are a distinct class of people from those useful citizens who have sought protection under our institutions, and made our country their home. Very few of them have their interest located here, or are bound to us by one of all the ties which connect a man with his country. They produce a large proportion of the offences and insubordination of which we have to complain. . . .'[22]

Chaplain Stewart, who was on the station in 1844-1845, wrote describ-

[20] McKeever to the Sec. of the Navy, 24 Nov. 1851. LCOBS.

[21] 'Cruises,' O.S.W. No. 28, Oct. 1839-Apr. 1840, p. 328.

[22] U. S. Senate, *Senate Documents*, 'Annual Report of the Sec. of the Navy,' 20th Cong., 2nd Sess., p. 135.

ing the size and composition of the crew of the frigate *Congress* and thus provided a picture of what was perhaps the typical pattern. *Congress* had a crew of five hundred men with an average age of twenty-five. Fifty of these men were criminals or fugitives from the law and the rest 'honest-hearted sailors or inexperienced and raw landsmen.' Included in the crew were twenty-four boys between ten and fifteen years of age. There were fourteen officers.[23]

Despite the fact that the Reverend Dr. Stewart thought that most of the crew were 'honest-hearted sailors,' apparently when the crew received liberty they were not on their best behavior, but then who would have been after months in the cramped quarters of the ship? The Chaplain reported that when liberty was granted scenes of drunkenness and debauchery resulted. Usually several of the crew were arrested and confined in the local *calabouço*. There they were placed in large rooms with eighty or more criminals of all types, colors and conditions. Besides the jail's being filthy and vermin-ridden, the officials provided no food so that the prisoners, American sailors included, often went hungry.[24]

Because the seamen were often at odds with the local authorities, one of the important responsibilities of the commander of the Brazil squadron lay in the management of the relations of the sailors with the Brazilians. The most serious incident of this nature occurred during October and November 1846 when Brazilian police arrested several disorderly American sailors while an American officer, Lieutenant Davis of *Columbia*, was attempting to take them back to the ship. Davis followed as the police dragged the seamen to the jail and protested their act. While there he, himself, was arrested and imprisoned overnight. The reaction of Davis' commander, Commodore Rousseau, was violent. He termed the act an 'outrage' and an 'insult' to him and through him to the United States. Rousseau not only requested that the American consul in Rio de Janeiro, Henry Wise, register an official protest with the Brazilian government, but showed his displeasure by refusing to take part in the official salute in honor of the baptism of the Imperial Princess. He informed the admiral commanding the Brazilian navy and the Minister of the Marine that he would not resume civilities until he received the apology which he demanded.[25] Both Wise and Rousseau wrote their own government that force might be necessary in resolving the problem and bringing an apology. Wise wrote the Secretary of State that 'the truth is, I re-

[23] Charles S. Stewart, *Brazil and La Plata: the personal record of a cruise* (New York: G. P. Putnam and Co., 1856), p. 128.

[24] Ibid., p. 10.

[25] Rousseau to the Sec. of the Navy, 24 Nov. 1846. LCOBS.

peat, these people need a lesson, and if need be a severe one to make them respect the rights and personal liberty of foreigners residing in this country. They have been spoiled completely by forbearance heretofore. . . .'[26] Rousseau wrote the Secretary of the Navy that

> I again beg leave to call the attention of the Department to the necessity of increasing the Naval Force on this station. The probability of what might ensue from the unrestrained passions of such a people as the Brazilians, when insulted as they now consider themselves to be will, I hope, convince the Department, without the addition of other considerations, that if our Government wishes to ensure the relations with them which both policy and interest dictate, the presence of a sufficient force will be the surest and safest means.[27]

With such an uncompromising and arrogant attitude on the part of the two chief American representatives on the scene, the equally strong reaction of the Brazilian government is understandable. The situation was further complicated by the violent popular reaction in Rio de Janeiro to the failure of Commodore Rousseau and Minister Wise to take part in the ceremonies honoring the baptism of the princess. Wise's behavior became so obnoxious that the Brazilian government requested his recall. Perhaps rightly, they believed him to be the cause of the naval officer's continued intransigence. Negotiations were transferred to Washington where the Brazilian government felt their minister compromised himself and he was recalled. The issue was then allowed to sink into the oblivion it deserved and time healed the wounded feelings on both sides. Commodore Rousseau made his peace with the Brazilians by joining in the salutes fired on the birthday of the Prince on 6 March 1847,[28] and relations between the two nations were restored in August when Brazil received the new American minister, David Tod, and prepared to send a new minister to Washington.[29]

Usually problems involving American seamen and Brazilian officials were much more easily resolved and concerned such relatively uncomplicated events as the imprisonment of enlisted men for drunkenness or disorderly conduct, an American seaman being murdered, as happened in Rio de Janeiro in 1843,[30] or an American seaman being charged with murder as was the case at Maldonado, Uruguay, in 1857. Ordinarily the commander of the squadron limited himself to requesting that local of-

[26] Wise to the Sec. of State, 16 Nov. 1846. LCOBS.

[27] Rousseau to the Sec. of the Navy, 24 Nov. 1846. LCOBS.

[28] Rousseau to the Sec. of the Navy, 6 Mar. 1847. LCOBS.

[29] S. L. Sioussat, 'James Buchanan,' in Samuel F. Bemis, ed., *American Secretaries of State* (New York: A. A. Knopf, 1928), V, 310-311.

[30] Shubrick to Sec. of the Navy, 23 May 1843. LCOBS.

ficials investigate all aspects of the case in question and ensure that justice be done.[31]

The maintenance of the health and well-being of their crews was another concern of the commanders of the squadron. The danger of epidemic on board ship—a dread scourge until modern times—was increased by local conditions on the station. Through much of the year yellow fever was epidemic in Rio de Janeiro. On the whole, however, the squadron was able to remain remarkably free of that fearsome disease and when American ships did get the disease on board, they were fortunate in that it was a mild strain and only two or three sailors died. Reports of the commanders are replete with references to the presence of the fever at Rio de Janeiro and their own enforced absence from that port. The fever epidemics were so protracted during the early fifties that Commodore Salter, then commander of the squadron, recommended that the headquarters be moved to a port on the Rio de la Plata. Yellow fever was not the only health hazard, though the other hazards were more or less common to men everywhere in that day. Conditions on board ship did make smallpox more difficult to combat than it would have been on land. Falls from the rigging were not unheard of and a wide variety of other kinds of accidents were almost everyday events.

Hospitalization for sick and disabled seamen of the squadron was also provided on the station. Whenever the nature of the illness made it possible, the invalids were kept on board ship until they recovered. If the illness appeared to be of a lengthy nature or the sailor had been disabled, arrangements were made for care on shore. The invalids were usually placed in the largest of the philanthropic hospitals maintained by the various orders of the Catholic church—Santa Casa da Misericórdia. This hospital, a large stone building overlooking the harbor, had one ward set aside for foreign seamen. The care there was scarcely more than practical nursing, though to contemporary eyes 'The wards were in perfect order and seemed to offer every evidence of providing everything needed for the care and comfort of the patients.'[32] Once off the ship the seamen were the responsibility of the American diplomatic representative in Rio de Janeiro. The American government paid one milreis per day for their care.[33] This was not inexpensive considering the general value of money and the current exchange rate of two milreis to the dollar. Since Rio de Janeiro was not only the headquarters of the Brazil squadron but also a

[31] Forrest to Villagnon, 6 May 1857. LCOBS.

[32] Stewart, op. cit., p. 228.

[33] Horner, op. cit., p. 86.

port of call for other American naval ships, there were almost always sick seamen waiting for transportation to the United States. Occasionally they were sent home in American merchant ships, but more often they were put aboard the storeships which called about every eight to ten months. The plight of the unhappy sailor who chanced to become ill or disabled and was consequently left alone to convalesce as best he might among strangers with whom he could not converse was not a happy one. Often he was forced to wait many months for transportation..

Not only did the Brazil station pose special problems for the commanders in maintaining the health of their sailors, but there were difficulties of a local nature in the maintenance of their ships. There were three reasons why ships often needed repair work done on the station. One was the especially destructive boring worm which was found in the waters off Brazil and Argentina. Any flaws in the copper sheathing of the ships soon resulted in serious damage to the wooden planking below the water line. A second was the weather on the station. Though the weather was usually mild, there was always some damage from normal heavy weather. There were also certain dangerous local storms, the most vicious of which were the quick-rising pamperos in the region of the Rio de la Plata. Then, too, any ships which sailed as far south as the lower part of Patagonia and on around the Horn were subjected to some of the severest weather found on any of the world's seas. The third cause for repair work on the station was the dispatch of ships from the United States which had been improperly conditioned.

Rio de Janeiro, because of its natural and man-made advantages, was the chief port on the east coast of South America, and the center of ship repair facilities. Even smaller ships, such as the schooner *Jamestown*, were unable to make repairs of any importance at ports other than Rio de Janeiro.[34] The most extensive ship repair facilities were those of the Brazilian government, and on a number of occasions American officers availed themselves of the hospitality of the Brazilian navy for services ranging from borrowing an anchor to performing major repairs. There were also private facilities available which were nearly as complete as those belonging to the government.[35] Almost every kind of repair work was performed on American ships at Rio de Janeiro with the exception of replacing the copper sheathing which the ships carried. By the mid-forties Rio afforded complete facilities for making repairs on steam engines. Thus with a few exceptions all the repair work which the squadron needed could be accomplished without it being necessary for the ships to leave the station.

[34] Downing to the Sec. of the Navy, 30 June 1853. LCOBS.
[35] Lynch to Salter, 12 Oct. 1854. LCOBS.

The difficulties involved in supplying the squadron were as troublesome as any of the administrative problems faced by the commanders of the squadron. They had to supervise ordering of food and naval stores from the United States and purchase of such items on the station, to arrange with the Brazilian government and Brazilian property owners for rental of a supply depot, to oversee the operations of the naval storekeeper, and to arrange the best possible exchange rate for the funds used by the squadron.

All supplies that could be efficiently provided from sources in the United States, and some that could not, were sent to Rio de Janeiro for the use of the squadron—from casks of sperm oil to hooks and thimbles, from barrels of butter to copper nails and casks of whiskey. There were several reasons for this practice. Supplies available in Brazil and other countries on the station were likely to vary greatly in quantity and quality and were apt to be overpriced. In addition to problems encountered on the station, the influence of American suppliers, in all likelihood, played a part. It is almost certain that nineteenth-century America had its own forerunner of the more recent 'buy America' program. A typical cargo of a supply ship arriving from the United States included cordage, copper nails, sheet copper, coal tar, sperm oil, paint, hammock stuff, a bower anchor, lumber of different sizes and uses, hooks and thimbles, and junk.[36] Another ship from the United States carrying food supplies discharged a cargo of bread, salt pork, flour, rice, dried apples, pickles, sugar, tea, butter, cheese, beans, molasses, vinegar, whiskey, coffee, and tobacco. Besides the food it carried salt-water soap, candles, mess pans, scrub brushes, shoes, mattresses, sheeting, tin ware, and iron.[37]

Despite, or rather in addition to, the efforts of the Navy Department to supply the squadron from the United States, the ships of the squadron carried on a lively trade with the merchants of Brazil. One of the storekeepers mentions doing business with over fifty different merchants in Rio de Janeiro within the space of a few days.[38] Trading was sharp and the Americans had to be careful in making their purchases. On one occasion a ship captain bitterly accused the storekeeper of buying inferior rice. The storekeeper's reply was that the inferior rice had been substituted for that which he had originally purchased. He remarked that this was a common practice and could only be prevented by careful inspection of goods on delivery.[39]

[36] Shubrick to the Sec. of the Navy, 15 June 1843. LCOBS.
[37] Steedman to the Sec. of the Navy, 28 Apr. 1859. LCOBS.
[38] Jones to Turner, 21 July 1843. LCOBS.
[39] Salter to the Sec. of the Navy, 17 Jan. 1856. LCOBS.

The quality, supply and price of merchandise were apt to vary considerably in any of the markets on the station. Specific complaints on one or more of these points were reported to the Navy Department with regard to purchase of salt beef, medical supplies, coal, and lumber. The actual extent of the trade of the squadron with local merchants remains obscure. At the very least it included purchases of fresh fruit, vegetables, meat and poultry, salted beef and pork, water, firewood, canvas, coal, medical supplies, bread, beans, rice, lumber, sugar, and ships' stores.

The basic diet of the sailor remained the same wherever the ships sailed. The staples of his diet were salt pork and beef, rice, beans, and biscuit. This was varied with such foods as dried apples, pickles, molasses, cheese, and butter. The men on the Brazil station were fortunate in that frequent purchases were made of fruit, fresh meat, poultry, and vegetables.

During the early years of the squadron's existence, supplies were shipped from the United States to Rio de Janeiro in private ships. Very often the naval supplies made up only a fraction of the ship's cargo. This practice early led to conflict with Brazilian authorities. To prevent smuggling, Brazilian regulations required that if any part of the cargo discharged by a merchant ship at Rio de Janeiro was consigned to private parties, the whole cargo would be subject to customs charges at the regular rate.[40] American diplomatic representatives sought to have this interpretation of the laws revised. The issue arose in 1826, 1833 and again in 1835. After the last date the Navy Department, with only occasional lapses, sent all the supplies from the United States in public ships. A lapse in 1842 cost the American government about $20,000 in unnecessary duties.[41] Supplies in public ships were permitted to enter duty free after the formality of requesting permission to discharge cargo.

Once the department had decided to send all supplies to the squadron in public ships, the naval supply ships began to arrive on the station about every eight to ten months, though the schedule varied considerably. Occasionally when supply ships did not arrive for a lengthy period, the commodore on the station would report to the department the shortage of supplies, pointing out how it hampered the operations of the squadron and expressing the hope that a supply ship was en route.[42]

After the supply ships had been cleared by customs and given permission to discharge their cargoes, the supplies were landed at the store-

[40] Hunter to the Sec. of the Navy, 9 Feb. 1835. LCOBS.
[41] Hunter to the Sec. of the Navy, 23 Dec. 1842. LCOBS.
[42] Storer to the Sec. of the Navy, 22 Nov. 1847. LCOBS.

house which the United States maintained at Rio de Janeiro. When the storehouse was first established is not clear. There are references to the storehouse in reports of the early thirties, so apparently it was established during the first seven or eight years following the creation of the squadron. The first storehouse located on the Ilha das Cobras was later moved to the island of Enchadas. Locating the storehouse on islands had two advantages—accessibility and isolation. The islands were more accessible to naval vessels than were most places on the harbor shore. On the other hand, separation from the mainland made it more difficult for supplies to be stolen and also made it easier for the naval officers to supervise the men working there. The American government leased facilities that usually included storehouses and loading equipment. The number of storehouses leased varied according to the amount of activity on the station. For several years during the forties the storehouse at Rio de Janeiro, according to one of the storekeepers, was the busiest in the navy.[43] It served not only the Brazil squadron but also ships going to and from the Pacific and East Indian squadrons.

Relations between the American tenants and their Brazilian landlords varied. Normally they were good, though there was a tendency on the part of the landlords to use pressure to obtain an increase in rent when the leases came up for renewal. The first contract of which there is record provided that the United States rent two storehouses and a shed on the island of Enchadas at an annual rent of 3,200 milreis.[44] When the contract was renewed in 1853, the owners almost doubled the rent and requested 6,000 milreis.[45] The contract was finally signed at 5,000 milreis. In addition to the facilities previously leased, the United States received access to and use of part of the beach and some loading equipment.[46] It is not clear what arrangements had to be made with the Brazilian government to obtain permission for the American navy to lease Brazilian property.

During the fifties there was considerable support for the suggestion that the headquarters of the squadron be moved to the Rio de la Plata and established at the Uruguayan port of Maldonado. The chief reason for suggesting the move was the almost annual recurrence of lengthy yellow-fever epidemics. Commodore McKeever pointed out in 1853 that the epidemics often lasted six months during which time it was danger-

[43] Ferguson to the Sec. of the Navy, 9 March 1845. LCOBS.

[44] Turner to the Sec. of the Navy, 1 Oct. 1843. LCOBS.

[45] McKeever to the Sec. of the Navy, 2 June 1853. LCOBS.

[46] Contract between Commodore Salter for the U. S. Navy and Vieira, Lage, Campos & Co., 26 Nov. 1853. LCOBS.

ous for either the supply ships or the ships of the squadron to call at that port.[47] The harbor at Maldonado was described as being 'safe and commodious' and out of the zone where yellow fever prevailed. Other advantages included reduced expenses for rental of storehouses, for lighterage fees, and for rental of the coal yard. There was a supply of fresh water on the site recommended at Maldonado which also would have reduced expenses under those at Rio de Janeiro.[48] Great Britain eventually purchased the island of Gorrito off Maldonado which the American officers had hoped their government would obtain.[49] The effort to move the headquarters and storehouse of the squadron was unsuccessful.

The naval storehouse was administered by a storekeeper appointed in the United States. The position was part of the spoils system, though, to judge by the complaints of the men who held the job, it was not a very choice plum. Letters from many of the storekeepers showed clearly that it was impossible for these men to support a family adequately in Rio de Janeiro on their salaries. Two of the men who held the post were accused of taking graft in the form of commissions from the merchants with whom they dealt.[50] The storekeepers also on occasion became involved in disputes with officers over the quantity and quality of the supplies which they provided.[51] The difficulties encountered in dealings with the Brazilian shopkeepers and middlemen did not make the job of the storekeepers easier. They were forced to deal with a large number of merchants with whom they usually could not converse directly and whose business practices were unfamiliar to them. Llewellyn Jones, who in 1843 was appointed purchasing agent as well as storekeeper, summed up his problems in a letter appealing for increased staff and office space.

> So far as this duty shall . . . devolve on me I shall endeavor to discharge it faithfully and with a little more experience, efficiently, I trust, but it should not be disguised that several clerks will be required to perform this service. For instance at this moment the 'Brandywine' and 'St. Louis' of the E.I. Squadron are taking in supplies. So also is the 'John Adams' of the Brazil Squadron, & the 'Columbus & Constitution' are hourly expected. Now on the requisitions appertaining to the two former vessels only, there are about *one hundred* different articles of stores not in our Navy Store. These articles are to be purchased of perhaps fifty different venders whose respective places of business are scattered over a large city. These venders speak a dialect strange to the Purser and to the other officers of the ship. A clerk must therefore be sent with each of them for the convenience of the Squadron will not admit

[47] McKeever to the Sec. of the Navy, 21 June 1853. LCOBS.
[48] Forrest to the Sec. of the Navy, 30 June 1857. LCOBS.
[49] Noah to the Sec. of the Navy, 10 Dec. 1860. LCOBS.
[50] Turner to the Sec. of the Navy, 6 Sept. 1843. LCOBS.
[51] Salter to the Sec. of the Navy, 26 Feb. 1856. LCOBS.

of delay. The Gunner, Boatswain and Carpenters mates must also be accompanied by an interpreter. So too with all the requirements of one of our ships of war. All of which to be understood at the Department must be stated in detail, and all of which, will require an order for the employment of such aid as may be necessary.[52]

Obtaining satisfactory exchange rates for the money used by the squadron was a continuing problem for the officers in charge. Drafts on the United States government sold at a large discount at both Rio de Janeiro and Buenos Aires throughout the period under study. The naval officers' problem was made more difficult because he was forced to deal on the money traders' terms. The irregularity of the ships' visits prevented him from following the vagaries of the money market which was termed by a local merchant as the 'most delicate, difficult, and uncertain of any branch of our business.' The nature of their operations forced the naval officers to buy at specific times without regard for the condition of the market. The problem was solved by establishing an account with the British banking firm of Baring Brothers. British commercial pre-eminence made bills of exchange drawn on the English firm negotiable at a much better rate than were bills drawn on the American government. In 1843 Commodore Turner considered turning the management of the exchange problems of the squadron over to a reliable American firm in Rio de Janeiro.[53] This idea was discarded, however, and the existing system retained.

Such was the work of the Brazil squadron. A more prosaic assignment can scarcely be imagined, yet it was an important assignment ably executed. At a cost of only one ship during its thirty-five-year history the squadron protected American rights and American property over a widespread area under conditions that were frequently exasperating and occasionally dangerous. While the squadron was less effective in suppressing American participation in the slave trade, this can hardly be blamed on the commanders of the squadron. The government in Washington never showed great concern about this problem and in the case of the Brazil squadron never provided its agents with a force sufficient to carry out the assignment. The squadron's relations with the governments of the nations on the eastern coast of South America were usually cordial. The commanders of the squadron maintained an attitude of respect and firmness which effectively protected American interests. The solutions of the squadron's administrative problems were skilfully handled. In sum, the ships of the Brazil squadron, as described by President John

[52] Jones to Turner, 21 July 1843. LCOBS.

[53] Turner to the Sec. of the Navy, 8 Sept. 1843, LCOBS.

Quincy Adams, 'have afforded protection to our commerce, have contributed to make our country advantageously known to foreign nations, have honorably employed multitudes of our seamen in the service of their country, and have inured numbers of youths to lives of manly hardihood.'[54]

As the situation in the United States grew more tense during 1860 and hostilities seemed to be imminent, the ships of the squadron were gradually withdrawn. On 13 September 1860 the brig *Bainbridge* was ordered to Boston,[55] and a month later *Dolphin* was directed to proceed immediately to Norfolk.[56] Eight months later when Flag Officer Sands received orders to take his flagship, *Congress*, to the United States, he reported that he was sailing at once and that the other remaining ship of war on the station, *Seminole*, was already at sea bound for home waters.[57] Only the little river ship, *Pulaski*, was left on the station, and then only because she was judged incapable of making the voyage back to the United States. Her commander was ordered to discharge her crew, most of whom had been recruited in the Rio de la Plata, and sell the ship, thus completing the disbanding of the Brazil squadron in June 1861.[58]

[54] Message of the President to both Houses of Congress, Dec. 5, 1826, U. S. House of Representatives, *Exec. Docs.*, 19th Cong., 2nd Sess., Doc. 2, p. 15.

[55] Sands to the Sec. of the Navy, 13 Sept. 1860. LCOBS.

[56] Sands to the Sec. of the Navy, 10 Nov. 1860. LCOBS.

[57] Sands to the Sec. of the Navy, 21 June 1861. LCOBS.

[58] Sands to Macomb, 20 June 1861. LCOBS.

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Commodore Isaac Hull manuscript

Mrs. Christopher McKee is working on a biography of Commodore Isaac Hull, and would like to hear from anyone having or knowing of manuscripts relating to him. She is especially anxious to locate personal letters of the Commodore and also his letterbook or books covering the period from November 1811 to February 1813, which are missing from the series in the New-York Historical Society. Mrs. McKee may be addressed at 7 Davidson Park, Lexington, Virginia.

You Can't Beat the Banca

BY T. L. SINCLAIR, JR.

IF you should sail across the Pacific, the first sign of life you would see upon approaching the Philippines would most likely be a *banca*, just a speck of a small boat on the sea. By the time you made port at Manila, from the deck of your ship you would have looked down on a good number of these unpretentious, flimsy-looking craft—fishing offshore, sailing up the coast, or merely paddling by.

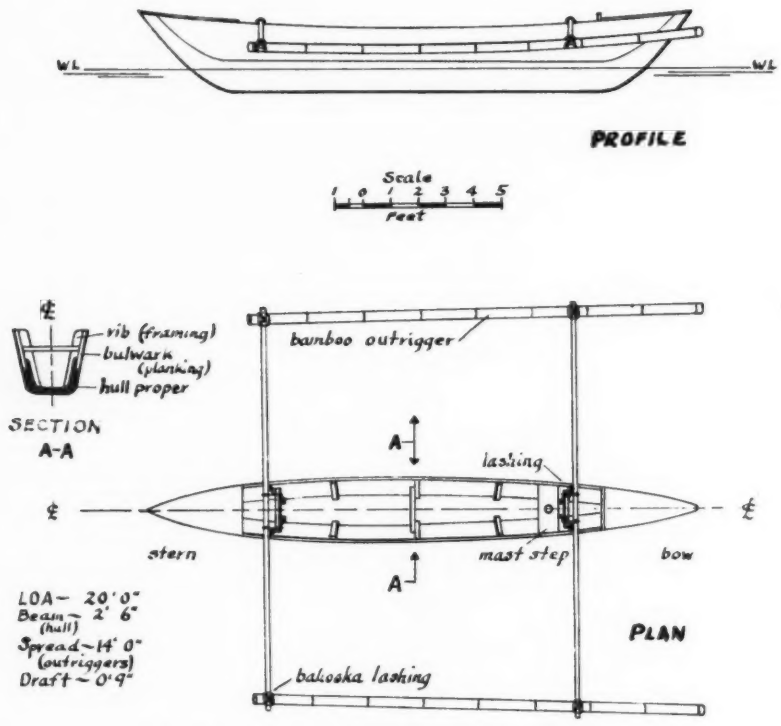
Among native craft all over the world, none is probably more lowly than the *banca*. She is hardly more than a primitively fashioned dugout canoe with outriggers, but don't let her frail appearance fool you. The common Filipino *banca* is tough, and she exists today simply because she is hard to beat.

Among her more sophisticated cousins, the ordinary *banca* is the workhorse of these islands. She can slide in shallowest water over a sandbar to go up a small river, bump over a coral reef, or grind her bow up high and dry on a rocky beach. She requires no boatyard for her original construction or repair, and she can 'dock' anywhere. Such qualities may not be so desirable elsewhere, but they are certainly important in the Philippine Islands. This persistent Oceanic type is well suited to the waters in which she is in everyday use, meeting rough conditions that would curl the keels of most foreign boats. Yet the little boat is exceptionally seaworthy and can move faster than most other small craft under paddle or sail.

So let's take a closer look at a typical *banca* to see what she has to be proud of. Here's a small edition, a twenty-footer, for example. Long ago she graduated from the really primitive class and became quite superior to her poor cousin, the dugout *boroto*. Her hull bottom is still a hollowed-out log, but that has ashamedly descended out of sight amidships to preserve her backbone or keel while she has developed her slim lines with built-up gunwales or planked sides. At the same time, her hull proper curves gracefully up in one solid piece to form narrow, pointed, double

ends of bow and stern. This main portion of her hull is fashioned from one of the superior Philippine hardwoods little known outside of the islands.

Of all things, the *banca* has a remarkable detail in the way she is fastened together. Her hull construction is not so unusual, where wooden pegs originally do the work of metal fastenings of screws or nails; but the



The Banca—a typical small boat of the Philippines

way her outrigger crosspieces are attached to the boat, and the two bamboo outriggers themselves are hung from the outstretched ends of these crosspieces, will surprise a Westerner. They are assembled with pieces of *bahooka*, strips of cane. The strips are wound neatly and tightly around the pieces to be fastened, and the bitter end can only be tied in a sort of loose figure eight around several winds of the lashing to bind securely upon itself. No normal knots can be tied in this material to secure the

end because it loses nearly all of its tensile strength when a sharp bend breaks through the main fibers of the strip. Each piece has to be made fast in a particular way familiar to native boatmen. These lashings are in many ways superior to use of rope because they do not stretch when wet. *Banca* outriggers then can dip underwater as frequently as they like without changing the nature of *bahooka* lashings. Furthermore, the *bahooka* is wound to expose only its smooth cane surface which is almost impervious to chafe or wear.

As for the outriggers themselves, it would be difficult and expensive to fashion any similar 'pontoon' to compare with the two four-inch-thick bamboo poles, with watertight compartments about every foot, which nature has devised to be exceptionally lightweight when appropriately seasoned. The assembly is so designed as to give the boat good overall trim while the outriggers are toed out from the lubber's line, inclined up forward, in a position that experience has determined to be best. Crosspieces, for example, with inboard lashings passing through a thole hole below the gunwale, are adjusted for the desired 'bow' to make their ends curve down on each side to where the two pole outriggers are hung to ride properly over the water.

Altogether, the *banca* is a boat with long lines and rounded bottom in her hull proper, able to glide easily through the water while balanced by outriggers that skim over the surface. Her most important features are natural shallow draft and tough keel member. These allow her to go anywhere in coral-cluttered shoal waters of the Philippines. From topside view, she looks delicate, but her hull bottom is exceptionally sturdy, and her lightweight outrigger framework is flexibly strong. She can not only explore over reefs where fish abound, but may readily be hauled out on any convenient island beach without appreciable damage.

One must consider the seagoing conditions around the Philippines to appreciate fully the good points of the *banca*. First of all, this is an archipelago of some 7,083 palm-fringed islands (7,084 at low tide) with a coastline nearly equal to that of the United States. Yet there are noticeably few good shelter harbors among the islands, while most of the Philippines lie in the path of typhoons that annually rip through this part of the world.

In a country where much of the population lives near the water, taking to the sea for fishing or for transportation, the *banca* is quite an ideal little boat. Her 'moorings' may occasionally be a fishing stake near her home; but you will usually find her, small boat or large, safely up on the beach to avoid bad weather, or even snug under her owner's shore-

side house, very much in the sensible habit of any self-respecting canoe. This discretion being the better part of valor also gives her time to dry out periodically to counteract the ravages of marine growth on her commonly unpainted hull. Native fishermen always allow some rain to collect in her bilge and then cover her with a makeshift *nipa* palm shed to keep her in best shape under a tropical sun over extended periods of haul out. Incidentally, the outrigger forward crosspiece on a *banca* happens to be in just the right position for manpower on each side of the hull to lift and drag her most easily up on the beach.

To be perfectly honest, we must admit that the word *banca* is a generic term, a name in the Tagalog dialect that may loosely be applied to nearly every one of a variety of Filipino boats. In the Visayan or central islands of this archipelago, there is the *balanra*, their largest, a three-masted sailing vessel of eighty feet or more. Then they have the *curican*, a smaller, two-masted sailer; the *paraw* (Malay *prahu* or *prao*); and finally the *tango*, which is the smallest and fastest of Visayan craft.

Down south around the Sulu Sea we find the *vinta*, fastest sailer of them all, and her big sister, the *kumpit*. And lowliest of all is the *boroto*, simply a small dugout, with or without a single outrigger on one side, to be paddled anywhere inshore. From experiences while working with the guerillas down south in Mindanao, during the war, I will even defend the *boroto*, knowing no boat—unless it is the 'piroque' of Louisiana bayous—that can better navigate tangled roots, vines, and tree stumps in the dark waters of a mangrove swamp.

If the names of various Filipino boats are confusing at first, there is some consolation in the thought that there is probably no expert, be he native fisherman or naval architect, who can precisely distinguish them all. Many names are nothing more than words from different dialects applied to practically the same type of craft. Most types are quite standardized, but it is safe to assume that something of an original creation has been produced by local touch in each area where native boatbuilders practice their craftsmanship.

It is a temptation to digress and talk about some of the more exotic boats among those mentioned. We could go into some interesting description of the *vinta*, a stylish, venturesome, and colorful Filipino boat, said to be the fastest sailing vessel in the world, and notorious for her part in the history of Moro piracy. But that would be sidetracking the subject of this piece, and the *vinta* deserves separate treatment to do her justice.

While native boats in the Philippines belong to quite a large family,

including distantly related cousins, the real *banca* is common and undistinguished, being simply plain and practical. The 'typical' small *banca*, of about twenty feet overall, eighteen-inch hull beam, and twelve-foot outrigger spread, is seldom decked over at all, showing only one or two board seats and athwartships braces in a complete boat. She may be rigged with a short mast stepped forward to carry a simple lug or lateen sail for going easily before the wind, but generally she is just paddled and can make exceptional speed under smooth strokes. Her steering is by paddle, and a rudder would only be a refinement fitted to her slim, overhanging stern when some sort of motor is installed for more modern propulsion.

With an extremely low-lying profile, the *banca* may appear fitted with a spray board rising near the bow, but her outriggers are more effective than one would think in preventing waves from shipping over her limited freeboard. For handy 'deck space' with such a narrow hull, on larger *bancas* you will often see 'sponsons' extending out from the gunwales where slats or bamboo strips are fastened to the crosspieces in rows parallel to the outriggers.

It is remarkable that the *banca* has seen so many vessels come and go through the centuries but remains undismayed and unimpressed, even by the ocean liners that tower over her today. She has seen Chinese, Arabs, Portuguese, Spaniards, Dutchmen, Britishers, and Americans come and go through the heydays of trade, conquest, and empire, leaving her much the same as before. Making her way here and there, she seems indifferent to progress around her, seeing little in modern refinement to improve upon her design for the work she has to do.

History has not seen fit to devote much space to the *banca*, although she was on hand when Magellan reached the Philippines in 1521, and saw Dewey enter Manila Bay in 1898. The narrative of Magellan's circumnavigation of the world practically dismisses the subject by remarking '. . . their boats are like ours' as it passes hurriedly on to more interesting details of people and places which the Spaniards were seeing for the first time.[1] There is ample evidence of Filipino dependence on boats in early writings of the Philippines, but no specific mention of a *banca* seems to appear before the relation of Simon de Anda's escape 'in a small *banca*' to organize resistance against the British attack and occupation of Manila in 1762.[2]

Nowadays native craft are faced with a question in the application of

[1] Blair and Robertson, 'Pigafetta's Account of Magellan's Voyage,' *The Philippine Islands*, Vol. 33.

[2] Montero y Vidal, *Historia General de Filipinas*, Vol. 2, Chap. 2.

modern power. In the Far East the challenge has been fairly well accepted in cheapest possible trial and error effort. If anyone thought the *banca* to be allergic to progress, he should be surprised at how quickly she has seen and adapted herself to practical advantage. It is doubtful whether the problem of installing a modern engine in a native boat has anywhere been solved as well as by Filipino fishermen. Before World War II, outboard motors were already in popular use throughout the islands, but that can not be counted so much in the *banca*'s favor. Use of an outboard motor has been easy, either hung from the aft crosspiece of the outrigger frame or better attached to the transom of a sawed-off stern. The adoption of inboard power is more to be appreciated. A two-man *banca*, such as we have described as average, more often than not now has a small, air-cooled engine neatly installed to turn a five-inch wheel that 'put-puts' the little boat at a good eight-knot turn of speed. As the result of initiative and experience among little-educated and financially limited fishermen, contrived with a shaft log of standard tubing and homemade stuffing box, the installation has simplicity, trim, and efficiency.

While the small *banca* has proved to be no slouch, modern power propulsion is best displayed in the larger boats. A detailed description has been given of 'everyman's *banca*' as a small boat; but there are also big *bancas* manned by groups of fishermen for fishing farther offshore. These larger boats, still long and low with twin outriggers, run to lengths of seventy-five or more feet and may carry some superstructure in a narrow cabin. Originally paddled galley-style by their crew, these 'fishing banks' vessels have generally taken to installation of a single two-hundred-horsepower diesel from engines available in the Philippines at low price as war surplus. I have seen a perfectly trimmed seventy-footer, diesel-engine powered, clipping along under good handling at an easy sixteen knots, hardly showing any bow wave or wake. With her hull, engine-room cabin, and short signal mast nicely painted, sponson decks cleared and everything shipshape while her crew was enjoying the fair weather, she was altogether a credit to native fishing.

Lest some reader begin to covet the practical advantages of the *banca* in dreams of designing some sort of trimaran, we should consider the definite shortcomings of this small boat—just a case of not being able to have everything in one neat package. First of all, a *banca* cannot pull alongside a low deck for loading or unloading, because her outriggers are in the way. Walk out on an outrigger and over she will go. This drawback makes little difference in the Philippines which hardly maintains any small boat piers because typhoons just carry them away. Being a

beach-jumper like our landing craft, the *banca* is most naturally loaded by the bow from any handy beach. This helps to make her a very useful boat for country people: the farmer, the fisherman, and especially barefoot boys. But to enjoy pleasure boating, the well-shod metropolitan does not care much for getting his feet wet, and that is usually necessary in boarding and casting off a beached *banca*.

Then, too, there is another disadvantage in that the *banca*, with her narrow beam and long, low sweep, does not have much capacity within her length to make her comfortable and dry. Added sponsons will baffle the waves, but are not for storing dry cargo. Any camper, who is expert at handling a canoe, can do well with a *banca*. But watch a *banca* fisherman, perched in an easy but tricky balance at the stern of his craft, as likely as not sitting on his haunches with feet on a transom board, and you will think again about adapting yourself to this type of boat. Someone has remarked that an American Indian from days gone by would let out an anguished war whoop if he saw the comfortable seats in a modern canoe. No doubt a *banca* boatman would feel just about the same way. To those who belong to a different age and a different way of life, the *banca* is a crude boat—unless a person should find himself having to depend on her at sea, in which case there would be a bond of understanding as with any good boat under the circumstances.

As has been gathered by now, handling a *banca* is naturally like handling a birchbark canoe. The stern paddler—and he may be the only one aboard—is also the helmsman, dipping a long, narrow blade straight down into the water and drawing the paddle back with a twist to keep her on course. For a novel variation in holding a boat alongside in a current, you may see a sternsman with one bare leg over the side, sculling his paddle in the arch of his foot. Little need be added to give credit to the men who skillfully handle their *bancas* at sea, although their countrymen are inclined to take them for granted. In boats of extremely low freeboard, they live in every sense close to the sea.

There are possibly some remaining skeptics, those impatient with 'backward' situations, who find it still hard to believe that the *banca* is worth much. Why doesn't the Filipino fisherman adopt something more modern than the *banca*? The most direct answer, and it should satisfy all doubts, is in the matter of cost. A *banca* can be built in the Philippines easily and quickly from materials nearly everywhere at hand at cost of little or nothing—a good-sized hardwood log, bamboo, cane—no special glue, fastenings, or marine paints needed in imports at foreign prices. Believe it or not, a native boatbuilder, working only with an adze and

bolo, can locally build a good small *banca* for about fifty pesos ($25.00), while it is difficult to find anyone to build a decent rowboat of comparable size from Western plans for less than one hundred and fifty ($75.00). That factor alone makes the *banca* hard to beat in this country, and native fishermen cannot afford to ignore it.

Yes, there are modernized native craft and well-powered larger boats, but the ordinary two-man *banca* survives as a common sight at many seaside doorsteps in the Philippines where she continues to fill the need for a practical small boat. In due time, no doubt, the *banca* will give way to later day design; but I venture to say that, like other tried and true boats, she will not retire before she sees something, quite different perhaps from what we may expect, to take her useful place. Until then, you can't beat the *banca* in her home waters!

Thomas Lowry Sinclair, Jr., has been interested in boats since he was a boy in the Philippines and China with his American Missionary parents. He has gone to sea as a deckhand on a freighter and as a commissioned officer in the United States Navy during the war. He is still a Commander U.S.N.R., and lives with his family near Manila where he has a boatbuilding business.

The Search for Captain Slocum

Under date of 20 April, Captain Slocum wrote to the *Times* of London from St. Helena the following brief but interesting letter:

> I sail today for America and home via Barbadoes. In a few days I shall have finished what I know is a very unusual voyage, but a voyage of commercial value to me. It is not 'the greatest show on earth' sort of scheme, neither am I 'a dime museum navigator.' My vessel is nine tons register net, 12.70 gross. Half that size would, I think, go round the world safely enough if well appointed and sailed with proper skill, and so I disclaim any attempt to show what may be done in the line of 'foolhardy' navigation. I have in the hold several tons of freight on 'ship's account' which will pay me the shipmaster's wages and more for the whole voyage. A pleasanter voyage I have not made in my whole life. I am an old shipmaster and not a stranger to ports in Great Britain, and, perhaps am not forgotten in China and Japan. I am today ten years younger than when I felled the first tree for the construction of the Spray.

Contributed by Capt. Edgar K. Thompson, U.S.N.

Notes on the First Fleet Engagement in the Civil War

BY ROBERT S. BURPO, JR.

THE first engagement in the War Between the States was fought by a flotilla of United States Naval gunboats (United States Naval Forces, Western Waters) and the River Defense Fleet acting under the orders of the Confederate Army. This engagement, the battle of Fort Pillow, occurred on 10 May 1862 and marked the first tactical use of rams in the war. Reports of this, the opening naval battle of the Civil War, were decidedly conflicting and contradictory.

Before discussing the gunboat battle at Fort Pillow, it might be well to consider the conditions that led to the formation of two opposing Mississippi River squadrons. The importance of the control of the Mississippi basin was recognized by the belligerents very early in the war and steps were taken by both sides to prevent the enemy from using this vital waterway for the transportation of food, munitions and commercial goods. After various strategic locations along the river had been fortified (by both the Yankees and the Confederates) and U.S.S. *Brooklyn* had been stationed so that she could blockade the mouth of the Mississippi (on 26 May 1861), both sides began to create river units for the purpose of wresting control of the waterway from the other.

Prior to the outbreak of hostilities, seven steam warships of various types had been constructed in the states that later formed the Confederacy. The engines of only two of these seven ships were contracted for in these same states. With such a paucity of shipbuilding experience, skilled mechanics and shipyards the South embarked on a war.[1] Or, '. . . at its very beginning, the new government found itself embarrassed with a wealth of officers, while it was poor beyond description in every other essential of the navy.'[2] On 15 March 1861 the Confederate Congress au-

[1] In the early part of the year 1861 there were two construction yards, one at Norfolk, Va., and the other at Pensacola, Fla., inside the Confederacy; there were no shops capable of building marine machinery, no rolling mills equipped to produce 2½-inch and thicker iron plate, and no ropewalks.

[2] J. T. Scharf, *History of the Confederate States Navy* (New York: Rogers and Sherwood, 1887), p. 33.

thorized President Davis to acquire, by construction or purchase, ten steam gunboats. Of these, five were to have a maximum tonnage of 750 and the remainder were to be about 1,000 tons. In a short time contracts were let to private firms and to newly established government yards for additional boats. Because of the lack of shipbuilding facilities and the scarcity of both artisans and supplies, many of the Mississippi River gunboats used by the Confederates were either confiscated or purchased from their owners and converted to warships.

When war became a certainty (after the attack on Fort Sumter) three powerful Ohio River steamers were converted into gunboats at Cincinnati by order of the United States Government.[3] These three boats were not 'ironclads'; but, rather, they were protected by vertical bulwarks of heavy oak planking surrounding their machinery spaces; and these bulwarks were pierced for cannon. The United States Quartermaster advertised for bids on the construction of seven river gunboats. This contract was awarded to James B. Eads who had converted *Conestoga, Lexington* and *Taylor*. In less than 100 days Eads completed his contract. These Eads-built gunboats were named *Cairo, Carondelet, Cincinnati, DeKalb, Louisville, Mound City,* and *Pittsburg*.[4] The captain of *Carondelet,* Commander Henry Walke, USN, gives the following description of his ship: 'She was 150 feet long and drew seven feet of water. The sides and casemate were built to the water line at an angle of about 45° with the level of the gundecks, which was about a foot above water and covered with the casemate to the curve of the bow and stern, enclosing the wheel, with all her machinery; three ports in the bow, four in each broadside, and two in the stern. Her armament consisted of three guns in the bow . . . two old 42-pounder rifled guns . . . and one 64-pounder. . . . Her broadside batteries consisted of two 42-pounders (rifled), two 64-pounders, and four light 32-pounders; and her stern battery was two light 32-pounders. The pilot-house was built on the upper deck, casemated and partially plated.' These were 600-ton boats, protected with 2½-inch iron plate and having a top speed of 9 miles per hour.[5]

Later *Benton* was added to this river fleet and she was considered to be Eads's masterpiece. She was the most powerful gunboat on the Mississippi until the appearance of the river monitors in 1864. This boat was pro-

[3] *Conestoga, Lexington* and *Taylor*.

[4] This list of names of the seven original Eads gunboats is given in *The History of the Confederate States Navy*; James Barnes, in the *Photographic History of the Civil War* (New York: Review of Reviews Publishing Co., 1911), Vol. 6, lists the seven names as *Cairo, Carondelet, Cincinnati, Louisville, Mound City, Pittsburg* and *St. Louis*.

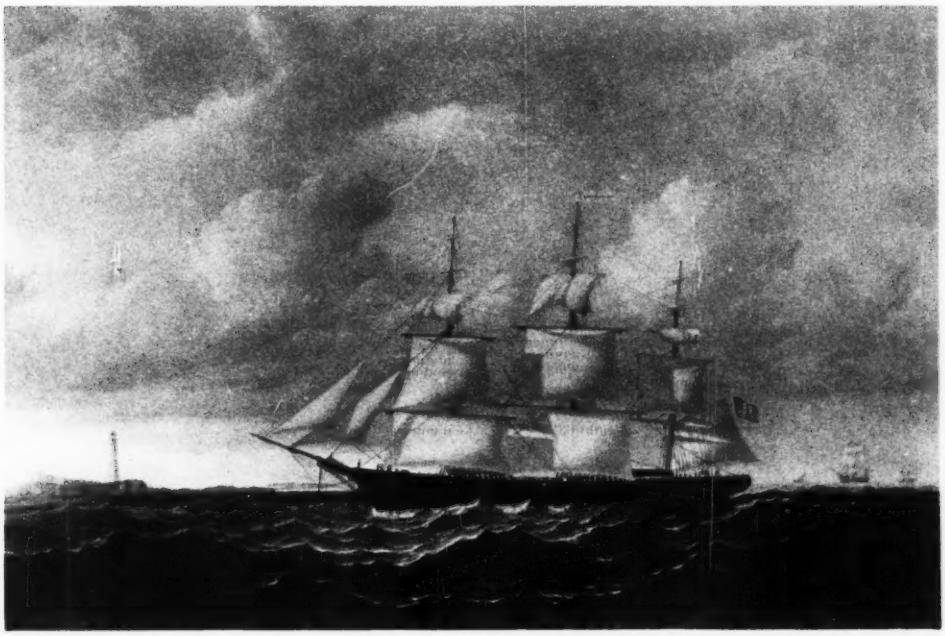
[5] Henry Walke, *Naval Scenes and Reminiscences of the Civil War in the United States, on the Southern and Western Waters* (New York: F. R. Reed and Co., 1887), p. 53.

THE AMERICAN NEPTUNE

Pictorial Supplement

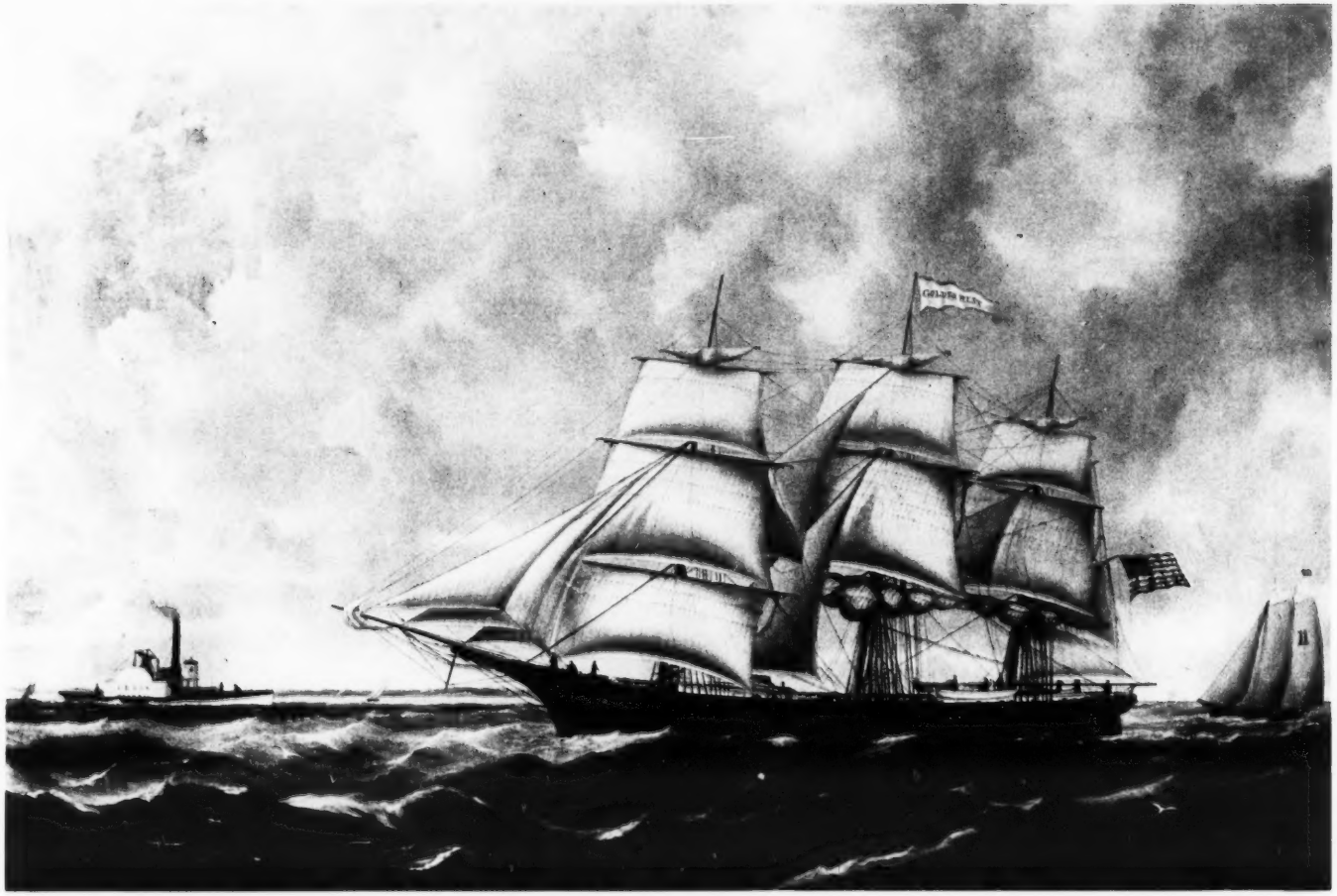
Paintings

THIS issue continues the series of clippers as seen through the eyes of the foremost marine artists of the day. All are from original paintings in the collection of the Peabody Museum of Salem.



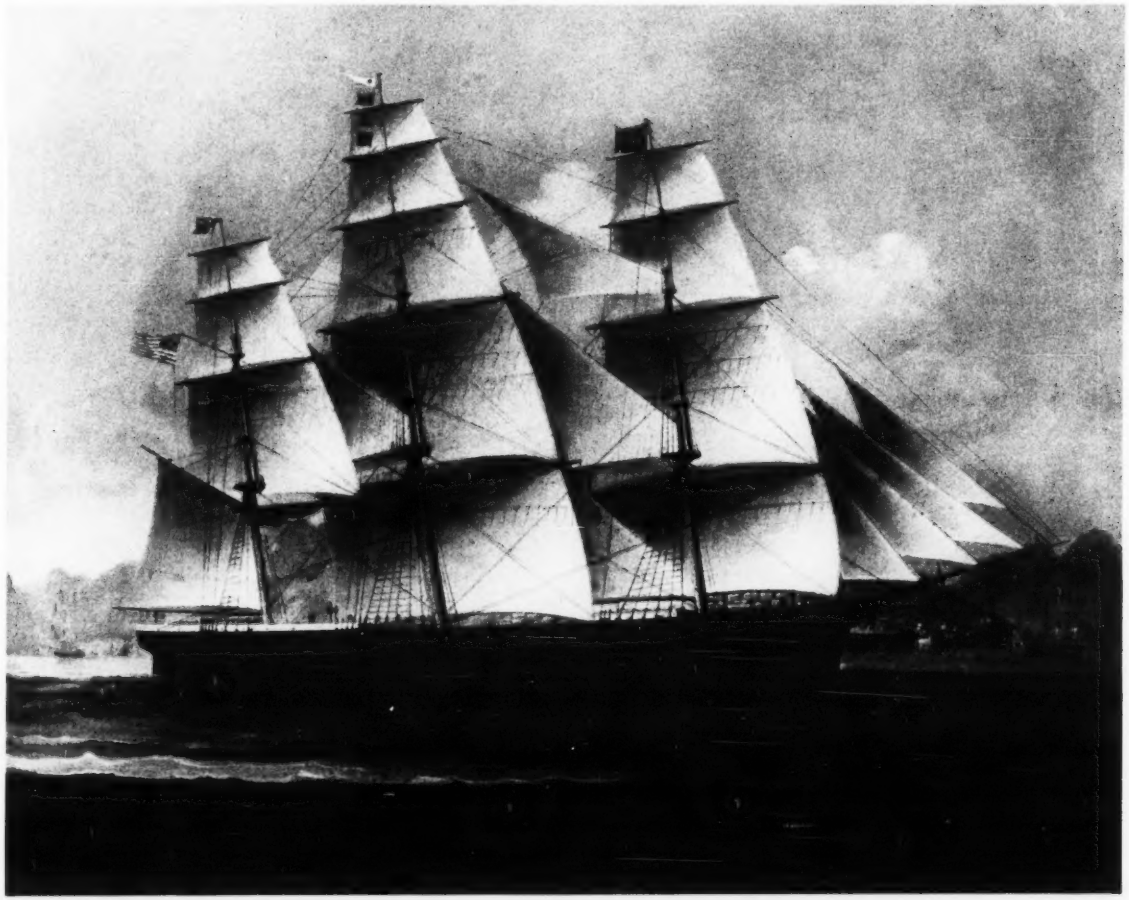
Dashing Wave. See Plate XII. Painted by William Bradford, 1855 for her first owner.

PLATE XXVI



Golden West, built by Paul Curtis, East Boston, 1852. Sold British, 1864. Fate unknown. Painted by J. B. Smith of Brooklyn, 1857 for her captain.

Golden West, built by Paul Curtis, East Boston, 1852. Sold British, 1864. Fate unknown. Painted by J. B. Smith of Brooklyn, 1857 for her captain.



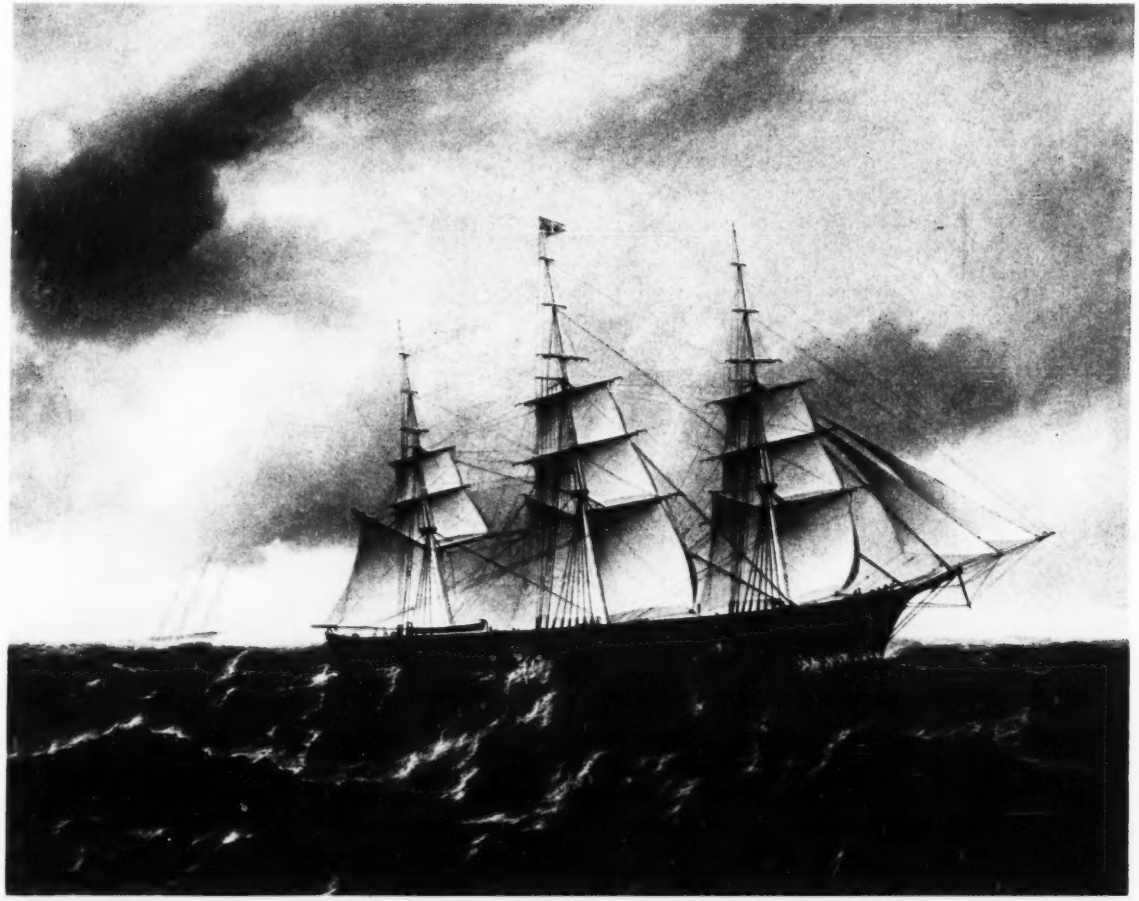
Malay, built by John Taylor, Chelsea, Mass., 1852. Condemned at Tahiti in 1891. Painted by an unidentified Chinese artist for her captain.

PLATE XXVIII

PLATE XXVIII

Golden Eagle, built by Hayden and Cudworth, Medford, Mass., 1852. Burned by C.S.S. *Alabama* February 21,

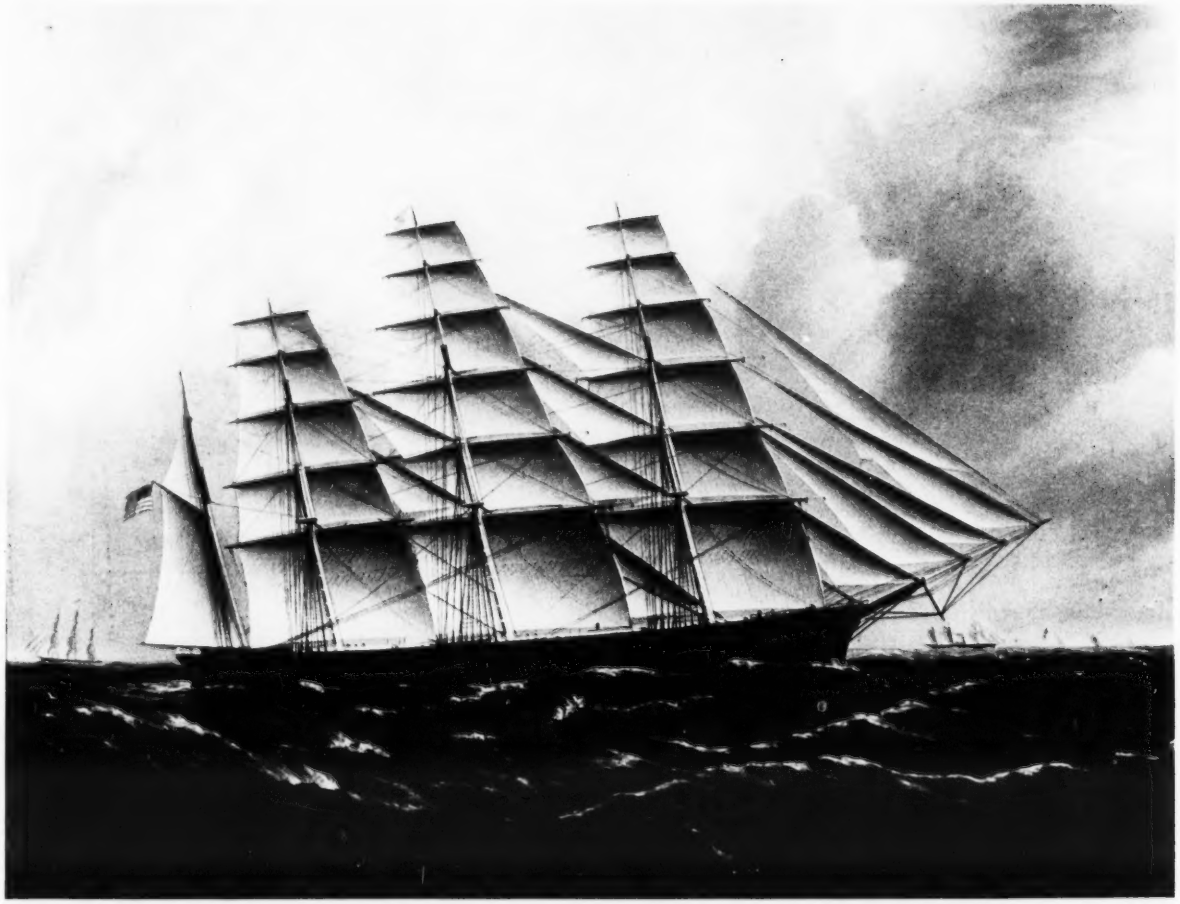
Golden Eagle, built by Hayden and Cudworth, Medford, Mass., 1852. Burned by C.S.S. *Alabama* February 21,



Water Witch, built by Fernald and Pettigrew, Portsmouth, N. H., 1853. Stranded in Lower California, 1855. Painted by James E. Butterworth.

PLATE XXIX

PLATE XXX



Great Republic. See Plate VI. Painted by James E. Butterworth for N. Currier's lithograph.

Great Republic. See Plate VI. Painted by James E. Butterworth for N. Currier's lithograph.

Derby, built by John Taylor, Chelsea, Mass., in 1855. Sold German 1876, Norwegian 1890. Fate not known. Painted by Hingqua for her first owner.

PLATE XXXII

Harvey Birch, built by Irons and Grinnell, Mystic, Conn., 1854. Burned by C.S.S. *Nashville* 1862. Painted by

tected by 3-inch iron plating and she carried sixteen guns (two 9-inch guns, seven rifled 42-pounders, and seven 32-pounders); her displacement was approximately 1,000 tons. *Benton* carried the flag of Flag Officer Andrew H. Foote until his transfer (after being wounded during the bombardment of Fort Henry, the first action of any note undertaken by the Federal squadron on the Mississippi), then when Flag Officer Charles H. Davis assumed command on 9 May 1862, he, likewise, used her as his flagship. The two gunboats *Essex* and *St. Louis* were added to this flotilla a bit later. It is uncertain whether *Benton* and *Essex* were converted river steamers (rebuilt by Eads) or whether they were built as gunboats by the famous contractor. In addition to the above listed gunboats, the United States Naval Forces, Western Waters, as originally organized included some thirty-eight mortar boats.

It is to be remembered that the Eads-built and/or converted gunboats were contracted for by the United States Army. Naval officers operated these steamers under the supervision of the Army until the first of October 1862 when they were turned over to the Navy, becoming the Mississippi Squadron at that time.

During the period when the Federals were assembling their flotilla on the upper Mississippi (its repair base was at Mound City, Illinois), the Confederate Navy (under the supervision of Flag Officer George N. Hollins) built *Arkansas* and *Tennessee* at Memphis. At the same time a number of river steamers were converted to gunboats by mounting cannon, adding protective planking, and by installing some iron plating on their bows as protection for the propulsion machinery only.[6] Changes, accidents and breakdowns reduced Hollins' fleet to the following (in early 1862): *Ivy*, *Livingston*, *Maurepas*, *McRae* (flagship), and *Gen. Polk*. These steamers carried a total of about twenty guns.

The United States Naval Forces, Western Waters, participated in the capture of Fort Henry (a joint Army-Navy expedition against the Confederate fort on 6 February 1862).[7] The gunboats and General Grant's army took Fort Donaldson on the Cumberland River on 16 February.[8] Then came the famous battle of Pittsburg Landing, or Shiloh, on 1 March, in which two of the gunboats took part.[9] Following these operations, the United States steamers aided in the capture of the notorious Island No. 10 on 6 and 7 April.

The above engagements set the stage for the first fleet encounter of

[6] *History of the Confederate States Navy*.

[7] The army was commanded by Gen. Grant and the gunboats by Flag Officer Foote.

[8] *Carondelet*, *Conestoga*, *Louisville*, *Pittsburg*, *St. Louis* (flag steamer), and *Taylor*.

[9] *Lexington* and *Taylor*.

Harvey Birch, built by Irons and Grinnell, Mystic, Conn., 1854. Burned by C.S.S. *Nashville* 1862. Painted by

the War Between the States. The United States Naval Forces, Western Waters, was organized on the upper Mississippi and it fought its way down river past the Confederate forts as indicated above. Flag Officer Hollins was determined to check this Union descent of the river even though his own fleet was far inferior to that of the Yankees.

After the combined action of the United States fleet and army that resulted in the evacuation of Island No. 10, Hollins considered the time appropriate for a 'do or die' stand to stem the advance of the United States forces. However, at the same time that he reached this decision, the authorities at New Orleans were quite concerned over the approach of Flag Officer David G. Farragut's fleet and Captain William C. Whittle (commandant of the Confederate naval station at New Orleans) begged Hollins to return to the Crescent City to supervise the afloat defenses of the city. As a result of this call for help, Hollins' fleet was broken up, some of his vessels going to New Orleans to aid in the defense of that city, and others remaining to be scattered down river when Fort Pillow fell. Upon his arrival in New Orleans Hollins was ordered to Richmond, leaving the River Defense Fleet to hold the river against the advance of the Yankees.

This River Defense Fleet was under the command of the Confederate general commanding the Mississippi Department and was, therefore, under the control of the War Department. The boats of this command were ex-river (commercial) craft converted to armed rams and they were commanded by experienced river pilots (each of whom exercised a somewhat independent command over his own ship). This River Defense Fleet was led by Captain James E. Montgomery. The Confederate general commanding indicated on more than one occasion that the organization of this fleet was quite inadequate and it (the fleet) should be turned over to the Confederate States Navy.

Montgomery's River Defense Fleet that steamed up the river to Fort Pillow to oppose Davis' gunboats was made up of the following eight vessels: *Gen. Beauregard* (4 guns), *Gen. Bragg* (3 guns), *Little Rebel* (the flagship and carrying 2 guns), *Col. Lovell* (4 guns), *Gen. Price* (4 guns), *Gen. Sumpter* (3 guns), *Gen. Jeff Thompson* (4 guns) and *Gen. Earl Van Dorn* (4 guns). These steamers had their bows encased in iron so that they could be used as rams; their boilers and machinery had been relocated down in the holds or otherwise given some measure of protection. And each ram carried from two to four guns, some of which were rifled. It was this fleet of rams that fought the battle above Fort Pillow with Flag Officer Davis' gunboats.

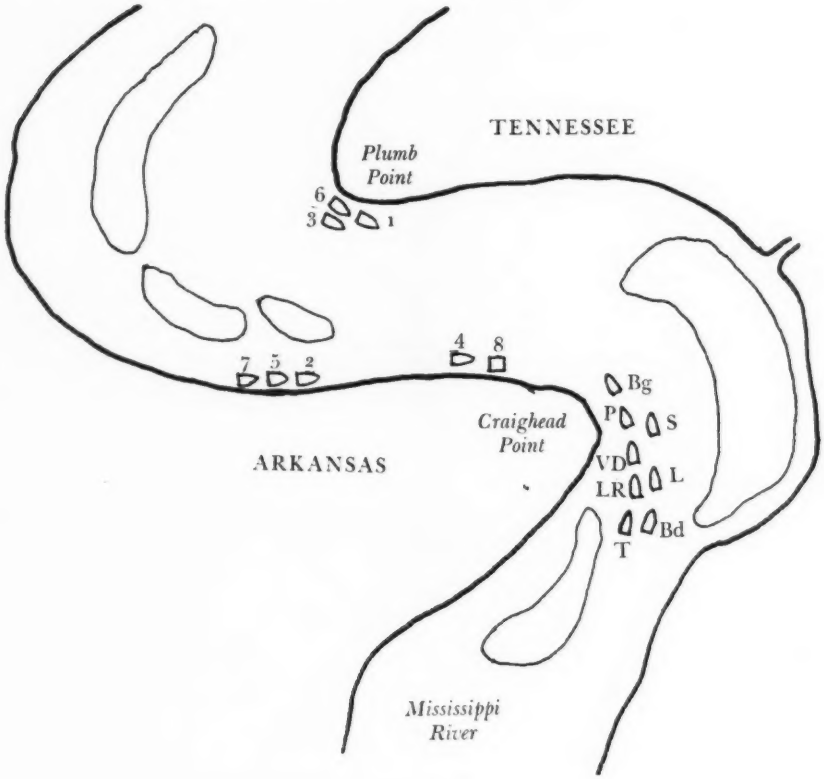
To return to the United States fleet: the Yankees arrived in the vicinity of Fort Pillow on 13 April 1862, and a scouting group made up of *Benton, Mound City, Carondelet* and *Cincinnati* ran as close to the Confederate fortifications as was thought prudent in order to obtain information on the strength of the enemy. Following this reconnaissance, the fort was subjected to a great quantity of shells from the mortar boats which accompanied the United States gunboats. Flag Officer Foote, prior to his being relieved, had considered sending two or three of his vessels below Fort Pillow to coöperate with General Pope who was to attack the fort from the rear (or land side). Then the army was ordered to Corinth, leaving the fleet with no land support for the capture of Fort Pillow.

Intelligence reports reaching Flag Officer Davis advised him that the Confederates were assembling a fleet preparatory to attacking and that the powerful gunboat *Louisiana,* of 16 guns, was expected to arrive from New Orleans any day. In the face of these reports, the Union fleet was standing by ready for any move that the Confederates might make. Also, during this period the mortar boats were towed into position each day so that they could shell Fort Pillow; these mortar boats were protected by one of the gunboats, a different one accompanying them each day. At this time the Federal fleet was anchored in two divisions; one division, the flagship *Benton* and two of the other gunboats (*Carondelet* and *Pittsburg*) were moored (heading downstream) to the Tennessee shore at Plumb Point; the other division, made up of *Cairo, Cincinnati, Mound City,* and *St. Louis,* was tied up to the Arkansas shore opposite Plumb Point (also heading downstream) and about six miles above Fort Pillow.

Early on the morning of 8 May 1862, the lookouts on the Federal ships observed plumes of smoke moving up the river. Soon three Confederate gunboats were visible steaming up from Fort Pillow.[10] They were headed for the positions where the Federal mortar boats were usually anchored when they were bombarding the enemy shore installations. The gunboats at the Arkansas shore opened fire on the leading Confederate; their shots all fell short and soon the cease-fire order was given. Since there was no mortar boat anchored in the stream that morning, the Confederates retired to Fort Pillow. Later, about six o'clock, two mortar boats were brought down to Craighead Point where they anchored and proceeded to bombard the fort all day; their fire went unanswered.

The day following this episode (9 May), the abstract logbook of the

[10] The log of the Confederate River Defense steamer *Gen. Price* records that on this date *Bragg, Sumpter* and *Van Dorn* were ordered to ascend the river and sink the Federal mortar boats. Upon arriving at the supposed anchorage of these boats, they were found to have been moved up behind the fleet, so the Confederates then retired to below the fort.



Sketch of the Mississippi River in the vicinity of Fort Pillow showing the relative positions of the Union and Confederate boats prior to the battle (taken from a sketch by Admiral Walke).

United States Gunboats

1. *Benton* (Flagship)
2. *Mound City*
3. *Carondelet*
4. *Cincinnati*
5. *St. Louis*
6. *Pittsburg*
7. *Cairo*
8. Mortar boat

Confederate Gunboats

L. *Little Rebel* (Flagship)
Bg. *Gen. Bragg*
Bd. *Gen. Beauregard*
P. *Gen. Price*
S. *Gen. Sumpter*
L. *Col. Lovell*
T. *Gen. Jeff Thompson*
VD. *Gen. Van Dorn*

United States gunboat *Carondelet* records the following incident: 'On the afternoon of the 9th a small steamer came up the river from Fort Pillow with a flag of truce. One of our tugs was immediately despatched, from the flag-steamer *Benton,* to meet her, and after a short conference, she returned with two Union surgeons, who had been made prisoners by the enemy at the battle of Belmont. By this *ruse de guerre,* or timely movement, the enemy obtained a perfect knowledge of the position of our fleet and mortar boats.'[11]

Thus the stage was set for the first engagement between fleet units of the United States and the Confederate States of America. It should be remembered that the United States Naval Forces, Western Waters, was made up of gunboats obtained under Army contracts and that these boats were operated by Navy personnel under Army operational orders. And the Confederate steamers were operated under Confederate Army orders. Thus, the Confederate Navy had no connection with the battle which occurred on the day following.

The morning of the 10th was calm and foggy. At about 4:00 A.M. one of the Federal mortar boats was towed downstream to Craighead Point with *Cincinnati* along as a guard boat. The mortar boat opened fire on Fort Pillow at 5:00 A.M.

The lookouts on *Carondelet* observed a heavy volume of smoke moving upstream from the direction of Fort Pillow. This was at 6:00 A.M. The word was quickly passed among the Federal gunboats and their crews were called to quarters. In about half an hour a Confederate fleet of nine vessels was dimly visible; the early morning fog still persisted. When the enemy appeared, the flagship *Benton* signalled the fleet to get underway. This signal was not observed on *Carondelet* and *Pittsburg* because of the low visibility; oral orders were then given from the flagship. However, both of these vessels got underway almost immediately after the Confederates were sighted, leaving *Benton* (for some reason unable to proceed) at her moorings. It was realized that *Cincinnati,* in her exposed position as a guard boat for the mortar boat, would be the first target for the advancing Confederate fleet. Hence both *Carondelet* and *Pittsburg,* followed by the vessels from the Arkansas shore anchorage, hastened to the aid of *Cincinnati,* four miles downstream and directly in the path of the oncoming enemy rams.[12] And *Cincinnati* had not been waiting to be attacked;

[11] *Naval Scenes,* p. 250.

[12] Admiral Walke (*Naval Scenes*) mentions a fleet of 'nine vessels'; he only lists the names of eight, however. Capt. Montgomery, the Confederate commander, names eight vessels as participating in this engagement (Report of Capt. J. E. Montgomery, *Off. Rec.,* X, 888). The Union officers were expecting an attack by Flag Officer Hollins' fleet, being unaware that Montgomery's flotilla had replaced it.

she had been lying near the Arkansas shore with steam up (evidently prepared for any emergency) and pressed forward to engage the rams. The leading Confederate, *Gen. Bragg,* steamed directly for *Cincinnati* and rammed her on the starboard side, tearing a hole in the shell room. As the two vessels lay alongside each other after the ramming, *Cincinnati* managed to fire on *Bragg,* scoring one direct hit; the shell passed completely through *Bragg* killing two men and otherwise doing very little damage. Following this encounter, *Gen. Sumpter* rammed *Cincinnati* twice in the stern causing considerable damage.[13] Both the Federal mortar boat and the now almost disabled *Cincinnati* kept firing at the enemy. The timely arrival of *Carondelet* saved *Cincinnati* from another ramming attack as the former joined in the battle.

Benton, evidently having engine trouble, was cut loose and allowed to drift downstream to the aid of *Carondelet* after *Cincinnati* had been damaged by the first attack of the rams. *Mound City* and *St. Louis* (from the Plumb Point anchorage) arrived to take part in the fight and almost immediately the former was rammed in the starboard bow by the Confederate *Van Dorn. Mound City,* now in a sinking condition, headed for shoal water where she was beached.

At this stage in the battle, the official Confederate report accuses the Yankees,[14] especially *Cincinnati,* of retreating '. . . where the water was too shallow for our boats to get at them; and as our cannon was far inferior to theirs, both in number and in size, I signalled our boats to fall back. . . .' The notes left by the first master of *Cincinnati* state that '. . . the *Cincinnati* was never in less than 5 fathoms of water from the commencement of the engagement until she struck the Tennessee shore and immediately sank. . . .'[13] *Cairo* and *Pittsburg* took little or no part in this battle as they arrived at the scene after the Confederates started their withdrawal. The damaged *Cincinnati,* aided by *Pittsburg* and a tug, made her way towards the shore; as the bow of the gunboat grounded, she sank with nothing but the forward part of the vessel remaining above water.[13]

After approximately one half hour this, the first fleet engagement of the War Between the States ended with two of the Federal gunboats sunk and three or four crew members killed; the Confederate rams suffered some damage and two men were reported killed.[14] Montgomery's rams were all able to withdraw to the protection of Fort Pillow. It would seem that the Union gunnery must have been a bit erratic to leave the

[13] From some unpublished notes by W. R. Hoel, First Master of *Cincinnati* and a Mississippi River pilot of many years' experience.

[14] Report of Capt. J. E. Montgomery, Senior Captain Commanding River Defense Fleet, *Off. Rec.,* X, 888.

eight more lightly armed rams afloat after a half hour of close-quarter fighting.

The commander of the River Defense Fleet was evidently unable to employ his rams to the best tactical advantage in this battle. The lack of a desire for closely coöperative action on the part of Montgomery's captains also served to limit the effectiveness of his flotilla. Otherwise it would seem that this battle might have been turned into a positive Confederate victory.

As a result of this action, Fort Pillow was evacuated on 4 June 1862. Thus the way was opened for the United States fleet to proceed to Memphis where a really decisive battle occurred that resulted in the elimination of the River Defense flotilla as a barrier to Union control of the Mississippi.

Robert S. Burpo, Jr., is a Commander in the United States Naval Reserve, on extended active duty with the Navy. His present duty assignment is with the Bureau of Ships, Department of the Navy, Washington, D. C. He is quite interested in nineteenth-century history, especially in the era of the naval history of the Civil War period.

Note abstracted from a notarial record kept by Daniel Moulton of York, Maine, 1746-1784.

DAMAGE TO CARGO. The sloop *Esther*, lying at anchor in the harbor of York, Maine, bound for Boston, the 'Mate having Occasion to Shift some of the Goods in the Hold discovered a bag of Feathers much wet & Damnified and upon search found that the Wet proceeded from one of the Hampers of Beer consigned to Capt. Samuel Waterhouse at Boston which stood upon the said Feathers and upon opening the same found all the Calks of the Bottles Sprung except two or three & all the Beer Work'd & Fromented out of the said Hamper except the Quantity of about five Bottles & it was conceived that it was occasioned by the Seas Tossing the Vessel together With the Intense Heat of the Weather.'

John Sellers, mate, and James Deshon, seaman, made oath to the above 10 July 1749.

Contributed by L. W. Jenkins

The Origins of Fore-and-Aft Rigs

PART II

BY RICHARD LeBARON BOWEN, JR.

VII

The 'rig' of a vessel is determined by the distinctive shape, number, and arrangement of the masts as well as the sails. Often one does not mean anything without the other. Therefore, to complete the story of the origins and diffusion of fore-and-aft rigs we must now consider the subject of masts. It is a fact that the first sailing craft carried only a single mast and sail. The Egyptians, the Phoenicians, and the classical Greeks used only a single mast. Ships with two masts and sails apparently first occur in the Mediterranean during Hellenistic times, but our first pictorial representations do not occur until Roman times.

Somewhat before 400 B.C. in the last part of the fifth century we have various references to an *akateion* mast and sail which was used on certain Greek warships.[117] That the *akateion* was a smaller sail is shown by its derivation from the word *akatos*, which was Greek for any sort of small boat. The *akateion* was apparently a smaller mast and sail which could be conveniently carried at all times. When these warships prepared for battle, they were drawn up to some beach and their larger (regular) mast and sail were removed and stacked on the beach. Then the smaller *akateion* was put aboard. It may have been used for maneuvering before battle, and it was certainly used in escaping after defeat, for in Greek literature we find the expression 'Hoisting the *akateion*' as a proverbial expression for running away. The ancient writings give the distinct impression that the *akateion* was a *substitute* for the regular mast and sail, set only when the larger mast was taken down and sent ashore, and that it was not a second mast and sail used in addition to the mainsail. Therefore, in all probability, during the fifth and fourth centuries B.C. the classical Greeks used only a single mast and sail.

Our evidence for the use of more than one mast and sail during Hel-

[117] C. Torr, *Ancient Ships* (Cambridge: University Press, 1895), pp. 86-88, discusses *akateion*, *dolon*, and *artemon* masts and sails.

lenistic times is not clean cut, but comes from several quarters which seem to indicate that three-masted ships were used during this time. The first is an account by Athenaeus (second century A.D.) who relates that King Hiero, a patron of Archimedes (287?-212 B.C.), had the *Syrakusia* built. She was the largest ship of her day, capable of carrying perhaps 1,650 tons, and she had three masts.[118] Athenaeus says he ran across the description in an author named Moschus, otherwise unknown, and he transcribes what he says are the words of this, presumably much earlier, writer.[119]

One might object that Athenaeus was writing about events some 400 years earlier, and thus might not be able to find works of that period. However, it was customary for many of the later Greek writers to use earlier material. Professor Casson points out to me that Lucian wrote in the second century A.D., but he mimicked the style of the fifth century B.C., and even pretended that the scenes he was describing were set in that age. Procopius, writing in the sixth century A.D., copied much from Xenophon, who lived about 800 years before he did![120] It is very hard to believe in this day of rapid advancement that these early works survived and were used almost a millennium later, but it is a fact.

The second piece of evidence relating to the use of three masts in Hellenistic times has been supplied to me by Professor Casson, and I quote him for this:

A late Roman writer (Pollux) gives a list of ancient types of warships: penteconter, trireme, quadrireme and so on, ending with 'the 15-er of Ptolemy and the *triarmenos* of Antigonus.' Tarn argues convincingly that the Antigonus must be Antigonus Gonatas (283-239 B.C.),[121] and that his ship must be a 16-er.[122] Now, even

[118] For the size of this ship see L. Casson, 'The Size of Ancient Merchant Ships,' in *Studi in onore di Aristide Calderini e Roberto Paribeni* (Milan, 1956), Vol. 1, pp. 231-238, esp. 233 and 237-238.

[119] I have asked the opinion of Professor Lionel Casson on the trustworthiness of Athenaeus' description, since for a number of years he has been concentrating on a study of Hellenistic shipping. He writes as follows:

'The account is full of holes; obviously the writer has mixed up a super-freighter with a super-dreadnought. But even though the elements of the story are doubtful, I am inclined to believe the gist of it, namely that super-freighters, carrying three masts, existed as early as 200 B.C., having been developed by the Hellenistic Greeks. Certainly they existed by the reign of Caligula (A.D. 37-41), since Pliny describes the 1200-tonner Caligula used to transport an obelisk from Egypt to Rome. My own feeling is that they were developed to carry grain cargoes from Egypt to Rome.

'The Ptolemies were carrying on a flourishing grain trade, and grain takes big ships since it is a bulky cargo. They had the vision to create everything else on a grand scale, so why not big freighters since they really needed them? They actually did create, they and the contemporary Hellenistic rulers, the greatest warships built in the ancient period. When the Romans under Caligula used a 1200-ton vessel to haul an obelisk overseas, I am sure that they merely commandeered one of the vessels of the Alexandrian grain fleet. Therefore, I believe the *Syrakusia* story.'

[120] C. Torr, op. cit., p. 87, n. 189.

[121] W. W. Tarn, 'The Dedicated Ship of Antigonus Gonatas,' *Journal of Hellenic Studies*, 30 (1910), 209-221.

[122] W. W. Tarn, *Hellenistic Military and Naval Developments* (Cambridge, 1930), pp. 133-134.

if Tarn is wrong, still the Antigonus cannot be later than Antigonus Doson (229-221 B.C.), and even if the ship is not a 16-er, it is clear that a big warship is being referred to. The context alone makes that clear.

The big question is what is meant by the word *triarmenos?* Obviously it must refer to a distinctive feature, so distinctive that Pollux chose to refer to the vessel by the feature, rather than calling it a 16-er or whatever its power ratio was. *Triarmenos* means etymologically 'trebly equipped.' Tarn claims that in the passage under discussion and elsewhere it means specifically 'triple-decked.' He is probably following Torr on this,[123] and Cook,[124] both of whom translate it the same way. Now I think that for once Torr is wrong. For one thing, there is no evidence that warships

Fig. 26. Three-masted ships. Left, third-century A.D. Roman ship from a mosaic at Ostia, port of ancient Rome. *(Drawn from a photograph of the original.)* Right, sixteenth-century ship with single square sails on each mast. *(After Jal,* Archéologie navale.)

had three decks. Secondly, an equation that Torr makes between *triarmenos* and *triparodos* on which he bases his translation is not at all justified. I believe that the two terms refer to two completely different phases of a vessel.

The important point is this: in Greek *armena*—the same word without the prefix *tri*—means 'rigging,' and at times 'sails.' Moreover, in Byzantine Greek there are three standard words for 'sail,' 'to sail,' and 'sailor': *armena, armenizo,* and *armenistes.* Admittedly, *triarmenos* means 'trebly equipped.' But, since *armena,* which originally meant simply 'equipment' came to mean a particular sort of equipment, namely 'rigging' or 'sails,' the most natural thing is to conclude that *triarmenos* underwent the same changes and consequently means 'having three sails.' All Greek dictionaries, including the latest edition, consistently translate *triarmenos* as 'with three sails.'

If the sole evidence we had for the existence of three-masted ships during Hellenistic times rested on the word *triarmenos,* we would certainly be hesitant in accepting it. However, when we add the evidence from Athenaeus concerning the three-masted *Syrakusia,* there is no reason to doubt that the Hellenistic Greeks did have three-masted ships, probably as early

[123] C. Torr, op. cit., p. 54.

[124] A. B. Cook, in L. Whibley's *Companion to Greek Studies* (Cambridge, 1905), p. 485.

as the third century B.C. The first positive reference to a three-masted ship comes from Pliny.[125] Our first representation of a three-masted ship in the Mediterranean comes from a third-century A.D. mosaic at Ostia (Fig. 26).[126] Since many of the features typical of Roman ships probably are survivals of earlier inventions, it seems logical to suppose that the three-masted rig was one of these.

Actually the date of the appearance of the first two-masted ship in the Mediterranean is more of a problem than the three-masted ship. Some have argued that a two-masted vessel obviously must have come before a three-masted one as a link between the one-master. However, I can conceive of a three-masted vessel coming from a one-masted vessel: a smaller foremast and mizzen were added forward and aft of the mainmast to get more sail area on a ship. It might actually seem that this was a logical step without changing the location of the mainmast. If a second mast were added, the location of the mainmast would have to be changed. Thus it would be easier to add two sails to existing designs, than it would be to add a second mast. So there is no reason why the three-masted ship had to evolve from a two-masted ship by adding a third mast.

However, we do seem to have some evidence to indicate that the three-masted ship did have a two-master for an ancestor. About 200 B.C. we have mention of a second sail called *dolon* from Greek sources.[127] Then around 100 B.C. we have the first reference to a sail and its mast called *artemon*.[128] Since this term is used by Roman writers in referring to a second mast and since we have literally dozens of illustrations of Roman ships showing a second mast, we can say with certainty exactly what the *artemon* was. In general it was a raking bowsprit.

The first illustration we have of this bowsprit is shown on a warship in a relief set up by Augustus to commemorate his victory at Actium in 31 B.C.[129] The first shown on a merchant vessel is from coins of Nero, *c.* A.D. 50 (Fig. 27-A). There are literally dozens of illustrations of these

[125] C. Torr, op. cit., p. 89.

[126] R. LeB. Bowen, Jr., 'A Three-Masted Roman Ship,' *Mariner's Mirror*, 41 (1955), 249-250. A news item by P. Hofmann, 'Etruscan Mural of Ship is Found,' in the *New York Times* of July 29, 1958, says that a newly found mural in an Etruscan tomb of about 500 B.C. shows a vessel with 'three fully rigged masts.' Professor Lionel Casson called my attention to this item. But he warned me that the ship was probably only single-masted, the edges of the sail being taken for two other masts, an event which has happened in the past on several occasions. I was fortunate enough to be able to examine a photograph of this ship, and Professor Casson was indeed correct in his suspicions: it is quite clearly a single-masted merchant ship.

[127] C. Torr, op. cit., p. 87.

[128] Ibid., p. 88.

[129] C. Torr, op. cit., Fig. 25. This piece of sculpture is generally connected with the battle of Actium which would date it 31 B.C.; cf. M. Rostovtzeff, *A History of the Ancient World, Vol. II: Rome* (Oxford, 1927), pl. 16-2.

single-masted ships with a slender bowsprit set at a high angle. Some show the small bow-spritsail set, others do not.

A century or so after the start of the Christian era we see the appearance

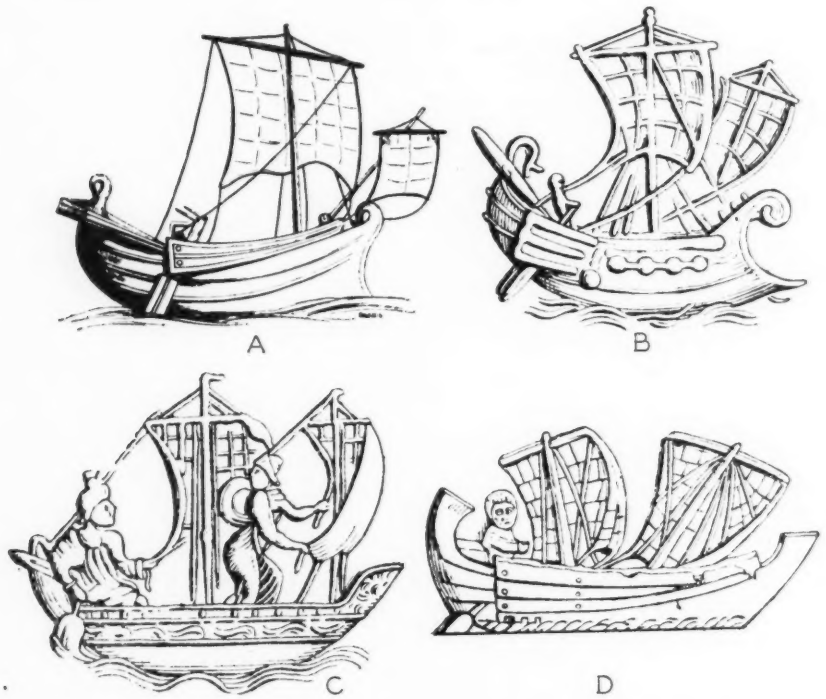


Fig. 27. Roman ships. A, Typical one-masted ship with the *artemon* bowspritsail. *(After Jal.)* B, C, D, Two-masted ships wherein the small bowsprit had been increased so that it was a foremast. *(After Torr,* Ancient Ships.)

of another type of ship. Here there is a definite foremast (Fig. 27-B, C, D). I know of about half a dozen of these,[130] and there are probably more. In all of these the foremast rakes strongly forward.[131] Since the foremast is not shown until the second and third centuries, one might reason that it

[130] The three reproduced in Fig. 27, b, c, & d, are taken from C. Torr, *Ancient Ships* (Cambridge: University Press, 1895), Figs. 28, 33, & 34. Another is shown by L. G. LaRoërie, 'A Roman Bowline,' *Mariner's Mirror,* 42 (1956), 248-249. Several are shown in the Piazzale delle Corporazioni mosaics of Ostia.

[131] One of these, shown in Fig. 27-c taken from Torr shows the foremast vertical. However, this is an error, and the originals from which Torr's illustration is taken—coins of Diocletian and Maximian

only developed after the start of the Christian era. Mention of the *artemon* about 100 B.C. and the *dolon* about 200 B.C. could have been in reference only to the bowsprit. On the other hand, one could argue that the type was not common, and thus was only rarely illustrated. Certainly the three-masted ship substantiates this. We have *one* illustration of a three-masted ship (*c.* A.D. 200), although the literature indicates that three-masted ships had been used over 400 years earlier.

One thing seems certain about these Roman two-masters. The forward rake of the foremast provides ample evidence that this mast evolved from the *artemon* bowsprit by moving it slightly aft, making it larger, and setting it at a higher angle. Now the Roman three-master (Fig. 26) shows this same type of raking foremast. Thus the three-master may have evolved from the two-master. However, there is a possibility that Hiero's three-masted ship did not have the masts arranged as in the preserved mosaic of the Roman three-master, and this mast may have become raked in imitation of the foremast on two-masters.

Since we do not know whether the *dolon* was simply an earlier name for the *artemon*, we cannot say with certainty how much before 100 B.C. the bowsprit was used on one-masters, but it is certainly safe to assume that the first mention of an *artemon* mast did not coincide with the invention of the spar. The evidence warrants the assumption that the bowsprit was developed sometime before 200 B.C., and that somewhat later the two- and three-masted-ship rig was perfected. We must credit the Hellenistic Greeks for these improvements in rig. It is almost certain that the classical Greeks did not know the bowsprit, for the extant Athenian dockyard records down to the end of the fourth century B.C. do not list any such equipment.

Trading vessels of the Roman empire first entered the Indian Ocean in force at the start of the Christian era. This has been indicated by Strabo, who, presumably referring to the first century B.C., relates that formerly under the Ptolemies only a few ships sailed to India annually, but that in the Principate of Augustus no fewer than 120 ships sailed from Myos Hormos for India every year.[132] The first Greek ship to sail directly from Egypt to India was possibly that of the Greek mariner Eudoxus who made a voyage about 120 B.C., and Hippalus' discovery of the short route to India can be placed about 90 B.C.[133]

—actually show forward rakes of 6° and 7°, so all known two-masted Roman ships have the forward mast raked forward. For illustrations of these coins see A. Alföldi, *A Festival of Isis in Rome under the Christian Emperors of the IVth Century* (Budapest, 1937), Plate I, Nos. 1 & 2. I am indebted to Professor Lionel Casson for this reference.

[132] Strabo, bk. 2, ch. 5, sec. 12; bk. 17, ch. 1, sec. 13.

[133] G. F. Hourani, op. cit., p. 24.

The Graeco-Roman ships sailing from Egypt to India under the Roman Empire were presumably of the same type common in the Mediterranean during this time: one-masters with a bowsprit and sail. This would seem to be substantiated by an Alexandrian coin of A.D. 67 which shows such a ship. The Indians possibly copied the idea of the small *artemon* bowsprit from these ships, for it is shown in the three-masted Ajanta ship of the seventh century A.D. (Fig. 20). The idea of this *artemon* headsail spread to Indonesia, for it is also shown on the eighth or ninth-century A.D. Boro Budur ships (Fig. 20). The *artemon* bowsprit certainly could have been introduced to India by Greeks before the start of the Principate, but it does not seem likely.

The evidence indicates that this *artemon* bowsprit was added to the existing two- and three-masted vessels of the Indian Ocean. We have seen that in the Mediterranean two- and three-masted Roman ships never show a bowsprit in addition to the foremast. There the *artemon* bowsprit was changed to a foremast by being set higher and by being larger. A second mast forward was definitely not added to a Mediterranean one-master with bowsprit. Further, the two- and three-masted rigs of the East were not copied from those of Graeco-Roman ships, for in the East the masts tended to be of equal heights, or on some two-masters there was a smaller mizzen. Such arrangements were not known in the Mediterranean until centuries after Roman times.

We have already said that Alexander the Great reached India by land in 326 B.C. Vessels were built in India for exploration of various coasts, but after his death in 323 these nautical preparations were not followed up. It remained for the Ptolemies of Egypt to open up a maritime trade route with the East, and we have seen that it was not used to any degree until after the start of the Roman Empire. The first Greek sailors to return to the Mediterranean from the Indian Ocean must have been full of tales of strange rigs. We have suggested above that they undoubtedly brought back the fore-and-aft spritsail from the Indian Ocean. It likewise seems that they probably brought back the *idea* of multi-masted rigs. However, they developed the idea to a different end design, just as they modified the design of the spritsail.

The natives of the Indian Ocean undoubtedly possessed two- and three-masted ships before the West did. Early Sanskrit records mention Indian vessels with one, two, three, and four masts.[134] Numerous second-century A.D. coins from South India show two-masted vessels with masts of equal

[134] R. Mookerji, *A History of Indian Shipping* (Bombay: Longmans, Green and Co., 1912), p. 25.

heights.[135] Thus the first Greek sailors or explorers presumably found rigs which made theirs look primitive so far as the number of masts and the type of sails went.[136] The Easterners used several masts on ships which were generally much smaller than the common Roman one-masters. They apparently could not get the required sail area with a single mast and sail because their materials of construction would not allow it. A mat sail would tear apart if too large. Further, it seems that their rigging was of a very primitive nature. On the other hand, two- and three-masted rigs were apparently developed in the West by the Hellenistic Greeks to use on the very largest ships.

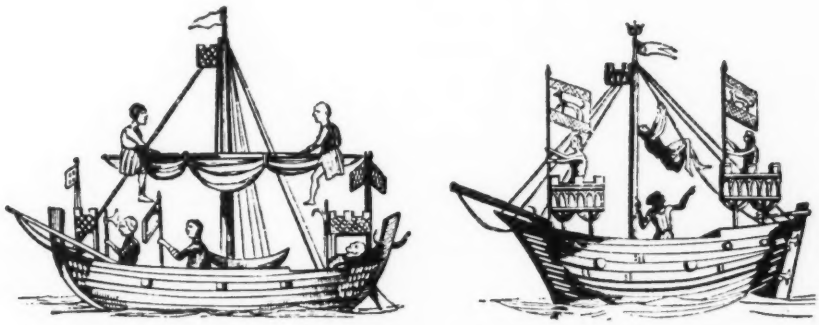


Fig. 28. Single-masted 'Northern' ships of the twelfth and thirteenth centuries showing the problematical lines hanging down from the ends of the bowsprits. *(After Jal.)*

The development of three-masted Greek ships anticipated the full-rigged ship with three masts by over a thousand years. The three-masted, square-rigged vessel with single square sails on each mast lasted until at least the start of the sixteenth century in Italy, for Jal has reproduced a sketch of such a vessel painted by Raphael (Fig. 26).[137] It is interesting to note that this vessel has a bowsprit, but with no sail set.

The single-masted, square-rigged vessel with bow-spritsail apparently died out in the Mediterranean after the decline of the Roman Empire. It was reintroduced to the Mediterranean from northern Europe during

[135] For a reconstruction of one of these vessels see R. LeB. Bowen, Jr., 'Eastern Sail Affinities,' AMERICAN NEPTUNE, XIII (1953), p. 202, Fig. 25.

[136] However, in construction, rigging, sail manufacture, and decoration these Graeco-Roman vessels were probably far superior to anything previously seen or later seen until the appearance of European vessels after A.D. 1500.

[137] A. Jal, *Archéologie Navale* (Paris, 1840), I, 292.

the fourteenth century. Most writers have maintained that the bow-spritsail (the 'water' sail of later times) had generally fallen into disuse by the start of the Renaissance and had to be invented anew. However, there is a possibility that the bowsprit (with sail) had spread to northern Europe during Roman times to be preserved after the withdrawal of the Roman Empire. The fact that we do not have any record of it before the twelfth century is no serious objection, since we have similar gaps in the history of both the fore-and-aft spritsail and the dipping lug between Roman times and the Renaissance. The bowsprit does differ in the fact that it presumably died out in the Mediterranean after Roman times. Nance relates that in northern Europe the bowsprit was employed only for setting bowlines, and only after 1480 was it employed for carrying a sail.[138] Moore states that we have no record of a bow-spritsail in northern Europe before 1450 at the very earliest.[139] Both these writers are being too cautious, for there does seem to be evidence that it probably was set.

Evidence is provided by the fact that many twelfth and thirteenth-century ships show a bowsprit with two lines hanging down from the end and leading back to the deck (Fig. 28).[140] I do not believe that anyone has shown that bowlines were used this early, and therefore these bowsprits could not have been used for this purpose. We must assume that the bowsprit and the lines leading out to its end had some purpose. Certainly it was not for the sole purpose of hanging an anchor. No intent can be seen other than setting a bow-spritsail. It should be borne in mind that most of these early medieval ships are invariably found on seals which were highly stylized. Generally they were shown with the mainsail furled, and thus not under sail. That the bow-spritsail yard was not left standing

[138] R. M. Nance, 'The Ship of the Renaissance,' *Mariner's Mirror*, 41 (1955), 287.

[139] Sir Alan Moore, 'Rig in Northern Europe,' *Mariner's Mirror*, 42 (1956), 9.

[140] A. Jal, *Archéologie Navale* (Paris, 1840), I, p. 153; A. Jal, *Glossaire Nautique* (Paris, 1847), p. 258. The essence of this argument that the first Northern bowsprits were for setting spritsails was presented in R. LeB. Bowen, Jr., 'A Roman Bowline,' *Mariner's Mirror*, 43 (1957), 61-62. R. C. Anderson, 'The Bowsprit and the Spritsail,' *Mariner's Mirror*, 43 (1957), 238, pointed out that there was written evidence of 'bowlines' in fourteenth-century England. However, we do not have any idea how these were used, and they were often used singly on a boat, whereas there were normally two bowlines. Dr. Anderson also pointed out that the seal of San Sebastian shows another line running from the end of the bowsprit to the end of the yard (with a furled sail) a little in from the end, just as a bowline should. This seal is dated at 1297 and is illustrated in G. de Artiñano, *La Arquitectura Naval Española* (Madrid, 1920), Pl. IV, No. VII. A line does indeed run from the end of the bowsprit to the end of the yard in this seal. However, the line in question still hangs down under the bowsprit. Therefore the line running to the end of the yard would seem to indicate that the line hanging down under the bowsprit was indeed *not* a bowline. It cannot be the running end of the 'bowline' running up to the yard, for this latter line is shown taut, while the line hanging down under the bowsprit is slack. Therefore this seal rules out the possibility that the hanging line could be a bowline. We are left with only two other reasonable explanations: a line for hanging the anchor or a line for setting a bow-spritsail. The latter seems the more reasonable explanation for the *raison d'être* of the bowsprit in the first place, although in all fairness it must be admitted that anchors are shown hanging from the ends of some of the early bowsprits. But these certainly do not prove that the bowsprit was erected simply to hold the anchor.

when not in use is substantiated by many sixteenth-century illustrations which show that the bow-spritsail was usually furled on its yard and stowed alongside the head rails.[141] And it is hitched to the lines which lead to the end of the bowsprit. It seems unreasonable for anyone to ask us to believe that this bow-spritsail was abandoned (even though its gear was still evident) and had to be invented again.

Sir Alan Moore suggests the impossibility of such a situation in his remarks about the first ships which had mizzens. They also show a bowsprit without any sail, even though they had the lines to set this sail. He says that it is hard to believe that such a ship without a headsail would have sailed, and suggests that perhaps the high, overhanging forecastle offered the surface of the spritsail.[142] In his sketch of this ship he shows the lines for setting a bow-spritsail. There is every reason for believing that it was set at times when the vessel was under sail. Certainly we have more evidence in this instance than we have in others in which we draw more speculative conclusions.

* * * * *

The commonest form of sailing ship in the Mediterranean from at least the twelfth century to recent times was the two-masted lateener, and the three-masted lateener was not unknown. In virtually every case the mainmast of two-masters is raked forward but the mizzenmast is more or less vertical. The forward rake of the mainmast obviously reflects the origin of this mast from the small *artemon* spar of Greek and Roman times. Some writers have credited the Arabs with the introduction of this two-masted rig, because today in the Indian Ocean the Arab dhow has a great mainmast and smaller mizzenmast both rigged with the Arab lateen (dipping lug).

However, two-masters with equal masts were known in Roman times (Fig. 27-D). Many of the later two-masted lateeners had this same mast arrangement (two equal masts with the forward one raked). Certain Mediterranean two-masters did have a much smaller mizzenmast, and these alone can be attributed to Arab influence. The two-masted Arab dhows of the Persian Gulf today have a strongly raked mainmast and a perfectly vertical mizzenmast. Arab dhows from the Red Sea and the Arabian Sea have both masts raked forward. I believe that the rake of the forward mast of the Persian Gulf dhows dates back to the introduction of the standing lug and has been preserved to this day as evidence of its Western origin.

141 R. M. Nance, op. cit., pp. 295-296.

142 Sir Alan Moore, op. cit., p. 9.

But the idea of a smaller mizzen definitely is of Eastern invention, for it is first shown in the eighth or ninth-century Boro Budur ships (Fig. 20), and does not occur in the Mediterranean until many centuries later.

Since the Boro Budur ships had this mast arrangement in the eighth or ninth century, it is logical to suppose that the Arabs and Persians likewise had it at an early date. Several thirteenth-century Arab miniatures show such two-masted vessels.[143] There is no valid argument against assuming that the Arabs changed the emphasis in the Mediterranean to the forward mast on some two-masters. After Roman times one of the first representations we have of a two-masted ship comes from the Leaning Tower of Pisa, where two of these vessels are shown.[144] These can be dated A.D. 1174. Both have strongly raked mainmasts which are slightly larger than the mizzenmasts.

Substantiating the supposition that the Arabs are responsible for the arrangement of a large forward mast (or smaller mizzenmast) on Mediterranean two-masters might be the word 'mizzen' itself. The Italian is *mezzana*, with its French offspring *misaine*, English 'mizzen,' etc. It has been suggested that *mezzana* is derived from the Arabic *mizan*, meaning 'balance,' and that the mizzenmast was called a balance because of its actual balancing effect on the rig.[145] This suggestion is weakened by the fact that the Arabs themselves do not call either this mast or sail *mizan*, but rather a subordinate of the mainmast, such as *daqal qalami* (reed mast) and *shira' qalami* (reed sail). The mainsail and mainmast are simple called *shira'* and *daqal*. 'Reed' sail probably has reference to a 'mat' sail, but the significance is not evident.

More positive linguistic evidence is offered by the names of certain two- and three-masted lateen vessels found in the Mediterranean in the eighteenth century. One type of vessel is generally known in English as the 'xebec' (sometimes 'zebec'). This English word presumably comes from the French *chebec* or the Spanish *jabeque* or *xabeque*. Probably in turn these came directly from the Arabic *sanbuq*, although some have argued that they came from the Arabic *shabuq*.[146] The Turkish *sumbeki* comes from the Arabic *sanbuq*, while the Italian *sciabecco* probably comes from the Spanish. Today one of the most common types of Arab dhows found in the Persian Gulf, the Arabian Sea, and the Red Sea is the *sanbuq*. The term, like all

[143] R. LeB. Bowen, Jr., 'Primitive Watercraft of Arabia,' AMERICAN NEPTUNE, XII (1952), Fig. 12.

[144] For a discussion of the ships on the Leaning Tower of Pisa see R. LeB. Bowen, Jr., 'The Pisa Ships,' *Mariner's Mirror*, 42 (1956), 79-82. A poor representation of one of the two ships was published by A. Jal, op. cit. They were also published by U. Nebbia, *Arte Navale Italiana* (Bergano, 1932).

[145] G. F. Hourani, op. cit., pp. 103-104.

[146] A. M. Fahmy, *Muslim Sea-Power in the Eastern Mediterranean* (London, 1950), p. 161.

Arabic names of vessels, applies to a specific type of hull design, rather than the rig of the vessels. But all of the larger of these *sanbuqs* are two masted.

Spain has always been one of the acknowledged strongholds of the lateen sail. Certainly there is no argument about the popularity of the lateen on the Mediterranean coasts of Spain. However, I do not believe that anyone has ever shown that the lateen was used to any degree on the northern coast of Spain. Here rigs seem to have been influenced more by the northern European coasts. A purely triangular lateen sail was used on sardine boats at Vigo Bay, a short 25 miles north of the Portuguese border.[147]

During the sixteenth century the Mediterranean galley was a common sight in the waters of the English Channel. The English navy used lateen rigged vessels as smaller craft in their fleets. Chapelle relates that the word 'pinnace' is an old name found in English marine nomenclature and was used as early as the fifteenth century to refer to a galley-like vessel.[148] Presumably these were originally lateen-rigged. The lateen rig spread to America at a very early age, undoubtedly with some of the first settlers. Both one- and two-masted lateeners are shown on numerous seventeenth-century illustrations of New York. Morris shows that the 'pinnace' of Colonial America was probably a two-masted lateener at times.[149] He also says that the lateen rig 'had entirely gone out of use' in America by 1700.[150] This is not correct because Brewington has published illustrations of Virginia and Maryland water-front scenes of about 1760 which show a single-masted and a two-masted lateener.[151] But there seems little doubt that the rig died out soon after this due to the influence of the newer leg-of-mutton and short-gaff rigs, both of which were originally two-masters. In the American navy the two-masted lateener was used up to the War of 1812.[152]

Thus it appears that the two-masted lateen rig spread to England and Holland by the sixteenth century and was in turn carried to America by the early colonists. However, the lateen mizzen of the two-masted, Mediterranean lateener probably found its way into northern Europe before the two-masted lateen rig itself reached that area. Early in the Renaissance a lateen mizzen was added to some of the one-masted, square-rigged

147 E. K. Chatterton, *Fore and Aft* (London: Seeley, Service & Co., 1912), p. 328, Fig. 127.

148 H. I. Chapelle, *American Small Sailing Craft* (New York: W. W. Norton & Company, 1951), p. 11.

149 E. P. Morris, op. cit., pp. 50-55.

150 Ibid., p. 22.

151 M. V. Brewington, *Chesapeake Bay* (Cambridge: Cornell Maritime Press, 1953), pp. 14, 122.

152 H. I. Chapelle, *The History of the American Sailing Navy* (New York: W. W. Norton & Company, 1949), pp. 179-242.

ships of the period making a form of a 'ketch' rig.[153] Several such illustrations are dated around 1430. The early ketches were square-rigged on the mainmast. Similar vessels existed in America at least until 1725, for in a view of Boston of that date a vessel is shown with a square mainsail set, a lateen mizzen set, a furled jib, and a yard for a main topsail.[154] The larger early Colonial 'catch' was probably of a similar nature, although it may have had a bow-spritsail instead of a jib. Even in later times when fore-and-aft gaff sails were placed on both main and mizzen there were square topsails set. The ketch was very popular in America during the seventeenth and eighteenth centuries, but was abandoned after 1800. Then about 1900 the ketch, and the specialized form, the yawl, were reintroduced to America from England for smaller fishing vessels and yachts. These latter vessels were completely fore-and-aft rigged.

The earliest form of ketch was derived from a one-masted, square-rigged vessel by the addition of a lateen mizzen. There was also a parallel line of evolution taken by smaller fore-and-aft craft. Chatterton has shown that there are several instances of sixteenth-century illustrations which show boats with a sprit mainsail, a jib, and a lateen mizzen.[155] The lateen mizzen was soon replaced with a fore-and-aft sail as is shown by a 1616 illustration of London which has two Dutch boats at anchor with sprit mainsails and smaller sprit mizzens (but no jibs).[156] Since these latter boats did not have jibs, they are not strictly ketch-rigged. However, it was the same lateen mizzen which gives many small fore-and-afters as well as the larger ketches their smaller after mast.

In early Colonial America there were very many small vessels in use for fishing with an average tonnage below 30 called 'catches.' It does not seem that they could have been rigged like the larger ketches, with a square mainsail and a lateen mizzen. It is this writer's opinion that they had two spritsails, the after one—(mizzen) smaller. This is based on two facts. First, such a rig was known to the English at least as early as 1616, and probably somewhat earlier. The second and more important fact is that during the nineteenth century a similar rig appears to have been one of the most popular rigs along the Atlantic seaboard of America. This has been graphically shown by Howard Chapelle in his *American Small Sailing Craft*,[157] for the majority of the local rigs he illustrates here are

[153] R. M. Nance, op. cit., pp. 180-192.

[154] E. P. Morris, op. cit., Plate VI, between Sections II & III.

[155] E. K. Chatterton, op. cit., pp. 62-63.

[156] E. P. Morris, op. cit., p. 141.

[157] H. I. Chapelle, *American Small Sailing Craft* (New York: W. W. Norton & Company, 1951). See also R. LeB. Bowen, Jr., 'The Spritsail in America,' *Mariner's Mirror*, 43 (1957), 240.

two-masted spritsail rigs with a smaller mizzen. Whether or not this rig was actually called a 'catch' in Colonial times is academic. The important point seems to be that the rig was undoubtedly used in America from the earliest times.

It does not seem that the Dutch could have introduced this rig (two spritsails) directly to America. As early as 1633 the Dutch were building and repairing vessels in New Amsterdam, and early records specifically mention 'yachts.' After 1629 certain Dutch vessels were rigged with two leg-of-mutton sails, and after about 1640 many Dutch rigs were changed to two short-gaff sails. It can only be assumed that the Dutch colonists followed the trend in Holland and replaced the two-masted spritsail rig with leg-of-mutton and short-gaff sails. Thus during the period when the Dutch could have influenced the rigs of America, they were undoubtedly going away from the two-masted spritsail rig. Dutch sail developments flowed consistently from Holland to England and thence to America. The two-masted spritsail rig must have also come to America from England. Evidence for this is found in the fact that this rig existed in England into recent times just as it did in America. H. Warrington Smyth shows dozens of nineteenth and twentieth-century examples from Scotland and England.[158] In Holland the rig apparently disappeared after the seventeenth century.

Returning to the East, the idea of two masts could have come to Java from either India or China. Early Sanskrit records indicate that the Indians were familiar with up to four-masted vessels. The sails of the seventh-century, three-masted, Ajanta ship are apparently tall Chinese lugs. Similar sails are used today in China. Since the South Indian coins of the second century A.D. show two masts, the Javanese probably obtained the idea of two masts from the Indians. However, it seems that we must credit either the Indonesians or the Persians with developing a larger forward mast. This is really a logical development in the Indian Ocean, where the monsoon winds blow with great regularity. With a large mast forward, one could sail before the wind with a large sail area presented. The fact that the mast was forward of the center of the craft made a very stable rig for sailing with the wind. When sailing into the wind, the mizzen was set to balance the rig. The idea of two masts spread eastward from India and/or Indonesia through the Oceanic Islands completely across the Pacific to South America.

The arrangement of two equal-sized masts seen on the second-century A.D. Indian coins is also preserved in a twelfth-century relief on the temple

[158] H. W. Smyth, op. cit.

of Bayon at Angkor in Cambodia (Fig. 21).[159] It was also found scattered across the Pacific (Fig. 29). Two-masted sailing canoes with equal masts are found in Melanesia at Astrolabe Bay in New Guinea and in the Bismarck Archipelago (Fig. 5).[160] Also in the Bismarck Archipelago are found two-masted canoes with masts and sails of the Boro Budur rig with the larger mast forward.[161]

In Polynesia two-masted canoes were found at Manihiki, the Society

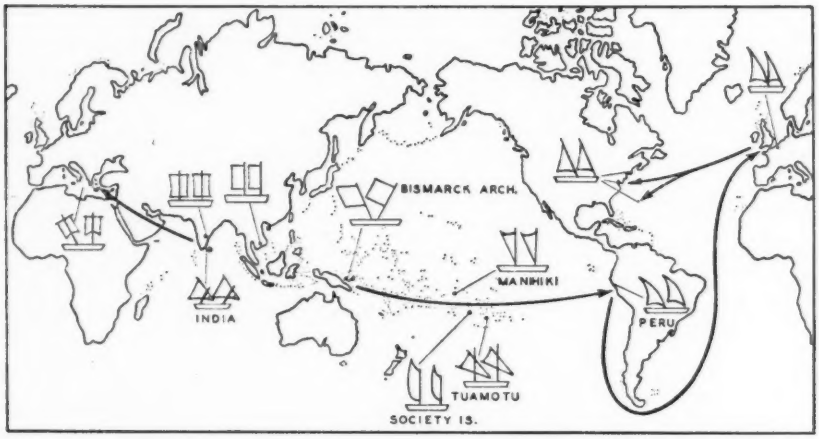


Fig. 29. The distribution of two equal masts on boats. The idea probably originated in the area somewhere between India and Indonesia. It was probably carried into the Mediterranean during Roman times. The idea of two equal masts spread across the Pacific Ocean all the way to Peru. From there it was carried to Holland, and thence to England, Bermuda, and America.

Islands, and the Tuamotu Archipelago.[162] With the exception of the Society Islands, where the foremast is slightly shorter, all have masts of equal height. There are good reasons for both the exception and the rule here. In the Society Islands the two-masted, Oceanic, spritsail rig was sailed in one direction only. In other places in Polynesia the canoes were sailed in either direction and thus logically the masts had to be the same heights.

While there is a continuous distribution of the use of two equal masts

159 J. Poujade, *La Route des Indes et Ses Navires* (Paris: Payot, 1946), p. 257.

160 A. C. Haddon, op. cit., pp. 158, 297.

161 R. LeB. Bowen, Jr., 'Eastern Sail Affinities,' AMERICAN NEPTUNE, XIII (1953), 205-207.

162 J. Hornell, *The Canoes of Polynesia, Fiji, and Micronesia* (Hawaii: B. P. Bishop Museum, 1936), pp. 81-82, 117, 184-188.

stretching from India through Indo-China and the Polynesian Islands to South America, I do not believe that the idea of equal masts necessarily spread out of India all the way to South America. The evidence shows that the idea of two unequal masts spread directly from Java to certain parts of Melanesia. In Melanesia the two unequal masts became equal when the rig was placed on canoes which sailed in both directions. Perhaps the idea of two equal masts spread to Polynesia directly from India or Melanesia, or the same evolution may have taken place in Polynesia from unequal masts. At any rate the gradual pressure eastward landed the two-masted, leg-of-mutton rig in South America before A.D. 1600 (Fig. 29).

We have seen above that Spilbergen published an illustration of the Peruvian two-masted, leg-of-mutton rig in 1619 which was immediately copied by the Dutch for the rig of small boats. This original rig was modified to a short-gaff sail by the addition of a small yard at the head. The leg-of-mutton sail and the short-gaff sail spread to America at an early date where they were at first used on two-masted vessels (Fig. 29). The single-masted forms were a modification or 'degeneration' of the original rigs. In America the two-masted, leg-of-mutton rig survived in Chesapeake Bay in the bugeye and the sharpie. The two-masted, short-gaff-rigged, topsail schooner owed the form and shape of its masts and fore-and-aft sails to the original short-gaff rig.

The earliest form of 'brig' consisted of a single-masted, square-rigged vessel to which a small foremast and square sail was added. One such ship is dated about 1430.[163] The brigantine evolved before 1700 when a high, short-gaff sail was set on the mainmast of such a two-master in place of the high square sail. The foremast remained square-rigged. Late in the eighteenth century the brigantine design split two ways. One design led to the brig when the square topsails were increased until the short-gaff was cut down to a spanker. Another design led to the hermaphrodite brig when the gaff was enlarged and a gaff topsail took the place of the square topsails. While the brigantine, the brig, the hermaphrodite brig, and the topsail schooner all fundamentally had a square-rigged ancestry, there is little doubt that their masts became equal height (or almost equal) under the influence of the two-masted, short-gaff rig. Thus these square-rigged vessels owe a debt to the Eastern two-masted rig just as the smaller craft do.

The Dutch are to be credited with introducing the idea of most two-masted rigs to northern Europe (excepting the lateen which came directly from the Mediterranean). They adopted the ketch rig from southern Europe by adding a lateen mizzen to various types of one-masted craft (Fig.

[163] R. M. Nance, op. cit, p. 192.

30). They derived the idea of two equal (or almost equal) masts from the Peruvians through Spilbergen's published illustration. The English probably introduced both mast arrangements to the American colonies.

The idea of more than one mast was undoubtedly invented in the East, although the Greeks may have invented the small bow-spritsail independently. The first two- and three-masted Greek rigs were probably

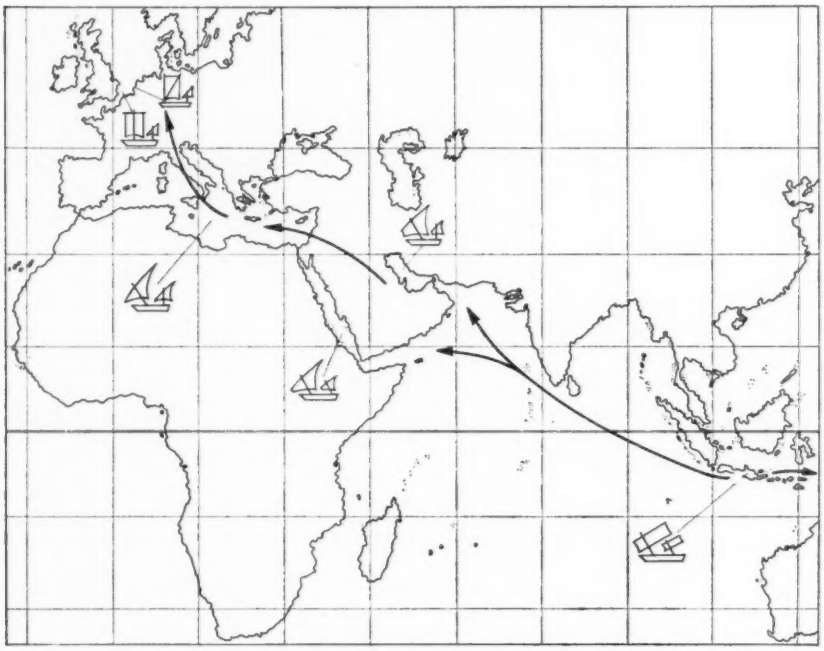


Fig. 30. The distribution of the 'ketch' rig. This rig seems to have originated in the East, possibly Indonesia. It became the preferred mast arrangement of the Arabs, who were probably responsible for spreading it so widely in the Mediterranean. The small lateen mizzen of the Southern lateener was added to fore-and-aft and square-rigged single-masters in the North, to produce the true fore-and-aft ketch rig.

inspired by the ships of the East, while the Arabs later introduced the 'ketch' rig on lateen vessels. It was not until the Renaissance that this idea was accepted in northern Europe. In the East the idea of two equal masts had developed and spread from Asia to South America. The Dutch carried this back to Holland (Fig. 29). Thus both arrangements of masts orig-

inated in the East. One ('ketch') traveled westward and the other (two equal or almost equal masts, or 'schooner') spread eastward to meet each other in Holland at almost the same time in history. The Greeks first developed the 'brig' rig in the Mediterranean.

We have seen that the Greeks apparently developed the first three-masted design with a mainmast, a smaller foremast, and a mizzen (Fig. 26). The same arrangement of masts is also found on many Chinese junks. It might be suggested that the Chinese adopted the idea from the first European three-masted ships in the China Seas, but the problem does not

Fig. 31. Three-masted Chinese ships. Left, ship of about 1520. Right, modern Amoy fishing junk. *(After Worcester.)*

seem to be as simple as this. In the first place, the rig was in use at least as early as 1520, for a Chinese woodcut of about this date shows such a craft (Fig. 31).[164] The mainmast is vertical, the foremast rakes forward, and the

[164] G. R. G. Worcester, 'The Chinese War Junk,' *Mariner's Mirror*, 34 (1948), 16-25. A three-masted sailing ship with square sails has recently been found carved on the chest of one of the stone giants of Easter Island, in the eastern Pacific. Thor Heyerdahl, *Aku-Aku* (New York: Rand-McNally, 1958), pp. 188-189, says that the vessel (shown facing p. 168) is certainly not European, but is a great boat made of reeds used by the ancient islanders. At first sight the illustration of the boat looks like a three-masted Chinese junk with low square sails hung from each of the three masts. The boat and these three sails show quite clearly on the fresh stone which was exposed by excavation of this giant. However, closer examination of the illustration shows that the masts continue on the weathered stone way above the lower square sails. Also evident on each mast are two sails above the lower ones. Since no native craft of the Pacific ever had more than three masts, or ever carried topsails on any mast before European ships entered the area, the boat is obviously a crude representation of a European sailing ship. It certainly is not a reed boat. Because of the primitive nature of the representation (no bowsprit or bow-spritsail, or headstays), it is probably the work of some native after the first European ship reached the island in 1722. However, it could also have been done before this date by a native who had seen an European ship somewhere else in the Pacific.

mizzenmast is placed at the very edge of the poop, like the bonadventure mizzen of some sixteenth-century ships. Mr. G. R. G. Worcester informs me that the first European ship (British) did not reach China until 1635.

Today many Chinese junks preserve this same mast arrangement with a raking foremast and a mizzenmast well aft. Such is excellently shown by the Amoy fishing junk illustrated by Worcester (Fig. 31).[165] It might be more than a coincidence that the foremast rakes forward in the same manner as the *artemon* on the three-masted Roman ship (Fig. 27). If there is a connection between the Chinese and the Roman three-master, the contact was probably made in India. Actually there is a three-masted, dipping-lug-rigged craft found today in South India.[166] The foremast does not rake forward, but this could have been altered in over a thousand years after its introduction by the Graeco-Romans. On the other hand, this Indian three-master could have been introduced by the Chinese. There is another possible explanation. The Chinese may have raked their foremasts in imitation of the Arab vessels which were in Chinese waters in the eighth and ninth centuries. Rather than use the Greeks as a *deus ex machina* to explain everything nautical in the Indian Ocean, I prefer the latter hypothesis.

We have mentioned that the Indonesians of Java and Sumatra used a two-masted, balance lug rig as shown in the Boro Budur ships with the forward mast larger. In contrast to these the majority of the two-masted craft of China and the Gulf of Siam have a small foremast. These are probably copied from the Chinese three-masters.

VIII

Up to the year 1954 it was steadfastly maintained that fore-and-aft sails were unknown until the Renaissance, and further that the Dutch invented all the basic forms. In 1954 Lionel Casson showed that the spritsail was known to the Greeks and the Romans during Roman times. This essay on fore-and-aft rigs shifts the origin of many fore-and-aft sails to the East. It is hoped that this study may also help to settle some of the arguments which have been offered over the last quarter century as to whether certain sail forms are the results of independent invention or simply represent diffusion. Most of the advanced forms of sails have apparently evolved from more primitive types by a process of gradual changes, many of which could have occurred accidentally. When the sails of both East

[165] G. R. G. Worcester, 'The Amoy Fishing Junk,' *Mariner's Mirror*, 40 (1954), 304-308.

[166] J. Hornell, *Water Transport* (Cambridge: University Press, 1946), p. 262.

and West are considered in their full range of time we find no evidence of the independent invention of identical sail forms. But we do find that basically similar types of sails evolved in widely separated areas. Thus the dipping lug developed in the West from the loose-footed square sail, while the balance and standing lugs evolved in the East from square sails with booms along the foot. These particular developments in the two areas appear to have taken place independently of each other.

In the past this writer has been a party to certain suggestions of independent invention for explaining similar sail forms in widely separated parts of the world. Specifically I presented evidence to show that the European spritsail and the Indonesian spritsail undoubtedly had independent origins.[167] This was the only instance where I was ready to admit independent invention. Professor Casson's disclosure that the spritsail was known in the Eastern Mediterranean during Roman times has now made it evident that the two must be related.

Professor G. Elliot Smith was probably one of the first to realize that the scattered elements of marine culture found around the world were generally the result of diffusion rather than independent invention. He summed up his views as follows: 'The definite and conclusive evidence for the spread of the art of shipbuilding and the consideration that a seagoing ship . . . becomes a model for imitation, has made most writers on the history of ship-building less prone to invoke the modern ethnological speculation of independent origin than those who concern themselves with what one might call the stationary arts and crafts.'[168] Before Charles Darwin published his *Origin of Species* in 1859 many of the greatest con-

[167] R. LeB. Bowen, Jr., 'Eastern Sail Affinities,' AMERICAN NEPTUNE, XIII (1953), 83-86.

[168] G. E. Smith, 'Ships as Evidence of the Migrations of Cultures,' *Journal of the Manchester Egyptian & Oriental Society*, 1916, pp. 63-102. Professor Smith was a physician and surgeon. Besides nautical design, he had traced embalming techniques and many other elements of material culture directly to Egypt. But he destroyed his case by insisting that everything came from Egypt. Because of flaws in his presentation, all of Smith's evidence has in general been thrown out. By even mentioning G. Elliot Smith here, this essay will be rejected in whole by many of the most ardent champions of 'Independent Invention.' But I am convinced that Smith was right in general about the spread of numerous elements of nautical design directly out of Egypt. But these were not necessarily carried by actual Egyptians. The rectangular square sail with a boom associated with a sheer or tripod mast found throughout the East is too peculiarly Egyptian to have been invented independently. For an excellent recent survey of the battle which still rages between the 'Diffusionists' and the 'Independent Inventionists' see G. F. Carter, 'The American Civilization Puzzle,' *Johns Hopkins Magazine*, February 1957.

This study of the sails of the world shows that man is basically uninventive. Sail forms appear to have been improved by slight modifications known as 'drift' to the anthropologist. New forms appearing about the world were borrowed from other parts of the globe. The uninventiveness of man and the failure of the 'similarity of man's mind' to produce similar results is shown by the fact that the fore-and-aft sail was not independently invented in the New World. Pre-Columbian fore-and-aft sails were concentrated about a central area of the west part of South America. These obviously represented an extension of the Asiatic influence which spread across the Pacific. For a map of the distribution of these sails see R. LeB. Bowen, Jr., 'Eastern Sail Affinities,' AMERICAN NEPTUNE, XIII (1953), 210.

temporary biologists believed that the successive forms of life shown in the geological record were all separate creations. There is now no evidence to indicate that the cultural evolution of sail forms is any different from organic evolution in the common origin of certain basic forms and the general dynamic change which continually took place.

After a study of the origins of the sails of the East, I came to the conclusion that 'It may be safely said that the sail is one of the most easily diffused cultural traits known to man.' I further concluded that 'Foreign influence is most often shown in the sail of a craft, while the hull is more often indigenous.'[169] This study of the fore-and-aft rig substantiates these conclusions to a degree that I would never have dreamed possible a few years ago. Changes in hull design have been less drastic than that of sail in general. The Western hull always remained far ahead of the Eastern hull, and outside of the catamaran and leeboards the West never borrowed any ideas on hull design from the East. In the East log rafts and reed canoes have remained for centuries after they were abandoned in the more primitive areas of the West.

The greatest single nautical invention outside of the boat itself is undoubtedly the square sail, which was invented in the Chalcolithic Near East. The next ranking invention would seem to be the Indonesian spritsail, which was probably developed sometime before the start of the Christian era. Admittedly this was only an alternate method of holding up a square sail, but it was undoubtedly the first true fore-and-aft sail. This is the type of change which involves the 'flash of genius.' The Indonesian spritsail led to the European spritsail, the Oceanic spritsail, the Oceanic lateen, the leg-of-mutton sail, the lofty sail of the Marconi rig, and the short-gaff sail. In the East the idea of multiple masts also seems to have developed before the start of the Christian era, and certainly ranks in third place for nautical inventions. The Greeks brought the idea back to the Mediterranean from the East and this eventually led to the development of the full-rigged ship.

Also in the East the Chinese balance lug sail ranks as an important invention, since it probably led to most of the forms of balance and standing lugs in the Malay Peninsula. These are probably responsible for the occurrence of the standing lug in Europe. The invention of the triangular jib is another 'flash of genius' idea; this can be attributed to the Dutch.[170] Finally, during Hellenistic and Roman times the Greeks and the Romans

[169] R. LeB. Bowen, Jr., op. cit., 82.

[170] E. Van Konijnenburg, *Shipbuilding from its Beginnings*, II, 35, fig. 139, shows a sketch (presumably of a Dutch craft) of a single-masted spritsail with jib, dated about 1500.

can be credited with an impressive list of nautical inventions. They certainly invented the *artemon* spar with its bow-spritsail. They can also be credited with the invention of topsails, an idea without which the full-rigged ship could never have been developed.[171] The final invention during Graeco-Roman times was the dipping lug, which appears on both Greek and Roman vessels. Thus all the elements which went into the full-rigged ship of the sixteenth century—three masts, a bow-spritsail, topsails, and the lateen (lug) for mizzen—were in use during Roman times. One should be extremely cautious in suggesting that many of these separate elements were invented independently during the Renaissance. Outside of the inventions listed above, no other developments of the sail warrant consideration as great inventions.

There were seven great periods of diffusion in the spreading of sail forms around the world which stand out. The first represents the Chalcolithic invention of the sail in the Near East. The Neolithic (New Stone Age) started about 5500 B.C. with the invention of agriculture and the domestication of animals, and represented the great change of prehistoric man from a food-gatherer to a food-producer.[172] The Neolithic in the Near East gave way to the Chalcolithic Age (copper and stone) around 4000 B.C., and this period led to the full Bronze Age about 3000 B.C. The first representations of sails known to man come from the late Chalcolithic Age (Late Gerzean, *c.* 3000 B.C.) of Egypt.[173] There is a pottery model of a boat from Mesopotamia which is several centuries earlier than these Egyptian sails. It has a socket in the center of the boat. It has been suggested that this was intended for a mast, and that holes at each side of the gunwales were for shrouds.[174] On the other hand, the socket might well be for a religious standard of some sort or for a figurine. At any rate, the earliest representations we have of sails came from Egypt. Whether the sail was invented in Mesopotamia or Egypt is not of much importance to this study, for it was originally square and remained so for thousands of years.

It can only be assumed that the basic forms of sail and rigging were

[171] Early Medieval travelers to the East reported Chinese ships with ten and twelve sails. Some writers have suggested that some of these must have been topsails. If this can be substantiated, then we must admit that the Graeco-Romans borrowed the idea of topsails from the East. However, it seems more probable that these figures refer to a number of sections of three or four sails.

[172] W. F. Albright, 'Relative Chronology of Palestine,' in R. W. Ehrich, *Relative Chronologies in Old World Archeology* (Chicago, 1954), p. 29.

[173] H. Frankfort, *Studies in Early Pottery of the Near East*, Part I (London: Royal Anthropological Institute, 1924), Fig. 15, p. 140, Pl. XIII. For an illustration of this latter boat see R. LeB. Bowen, Jr., 'Arab Dhows of Eastern Arabia,' AMERICAN NEPTUNE, IX (1949), Fig. 1, p. 89.

[174] S. Lloyd and F. Safar, 'Eridu,' *Sumer*, IV (1948), 115-127, Pl. V.

more or less the same in the period from 3000 B.C. to 2500 B.C. in all the great Bronze Age civilizations of the Near East, immediately following the invention of the sail. The square sail (with a boom at its foot) set on a sheer mast was probably passed eastward in the Indian Ocean by the Indus Civilization, which lasted from 2500 B.C. to 1500 B.C.[175] This represented the second great period of sail diffusion. A tall mat sail with boom on a sheer mast is found on a reed boat at Lake Titicaca in South

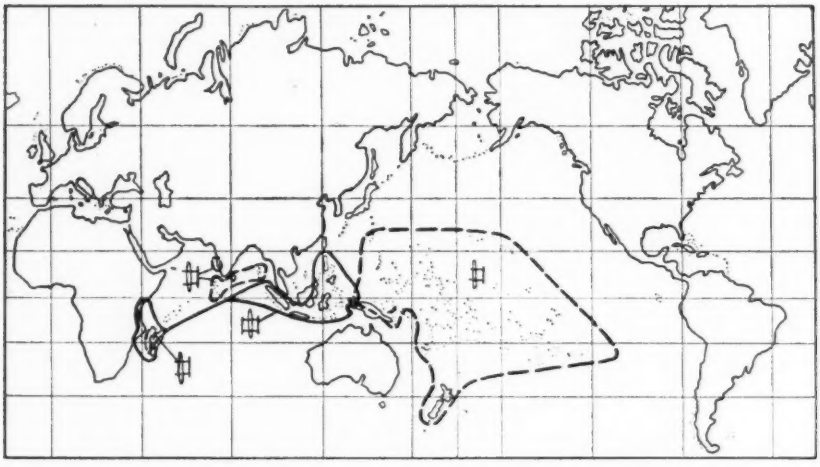


Fig. 32. The distribution of outrigger canoes. The dashed line encloses the area covered by single outriggers; the solid line, double outriggers.

America. This sail with sheer mast may have spread along the shores of the Pacific, since the tripod mast is found on the coasts of the Sea of Okhotsk in the extreme Northwest Pacific.[176] Tall, square, mat sails were also used by the Japanese.

The third great period of sail diffusion is rather poorly defined, but is mainly concerned with the accomplishments of people we will call the Indonesians for lack of a better term. Somewhat after the fourth century B.C. westward migrations from Indonesia undoubtedly spread the Indonesian spritsail to Ceylon, Madagascar, and Arabia (Fig. 2). Sometime in the first millennium B.C. the Indonesian spritsail spread into the Oceanic Islands and gave rise to the great variety of sails which eventually

[175] R. LeB. Bowen, Jr., 'Boats of the Indus Civilization,' *Mariner's Mirror*, 42 (1956), 279-290.

[176] E. K. Chatterton, *Sailing Ships* (London: Sidgwick & Jackson, Ltd., 1909), p. 33.

evolved there. The combined distribution of the double and single outrigger canoes (Fig. 32) corresponds almost exactly with the east and west limits of what may be called Indonesian sails.[177] This period was extended by the Polynesians in spreading Indonesian sails on rafts with centerboards to South America (Fig. 33). Since the outrigger canoe was unknown in either North or South America, the outrigger may have spread into Polynesia after the raft.

The fourth period of sail diffusion was undoubtedly started by the Phoenicians. While Indonesian sail forms were spreading out over the Indian and Pacific Oceans, another sail type was gradually spreading west

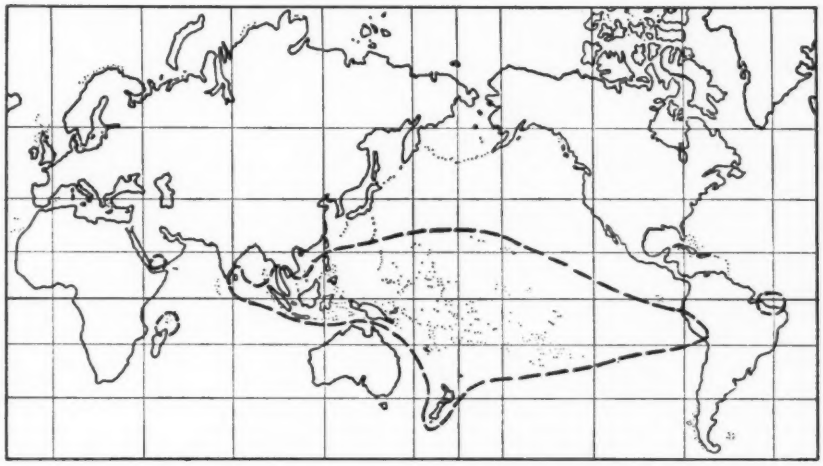


Fig. 33. The distribution of Indonesian sails. The dashed line encloses the area of Indonesian sails, and spreads to South America in the east, and India, Arabia, and Madagascar in the west.

over the Mediterranean and north up the Atlantic coast. We have already mentioned that around 1500 B.C. Syrian ships are shown with typical wide Egyptian square sails with booms at their bottoms. But about 1200 B.C. both Egyptian and Syrian ships appear with square sails without booms. Whether this was an Egyptian, Syrian, or perhaps even Minoan or Mycenaean invention is not evident. The small representations of sails on Minoan seals and gems are too small to say whether or not they have booms. At any rate, the square sail without a boom was first used in the

[177] R. LeB. Bowen, Jr., 'Eastern Sail Affinities,' AMERICAN NEPTUNE, XIII (1953), 211.

most eastern part of the Mediterranean sometime before 1200 B.C. This sail in basically the same form was used by the Phoenicians, the Etruscans, the Greeks, the Carthaginians, and the Romans in roughly that order.

Phoenicians were early traveling to the Cassiterides, or the 'Tin Islands.' But they kept the secret of the location of this source of tin so well

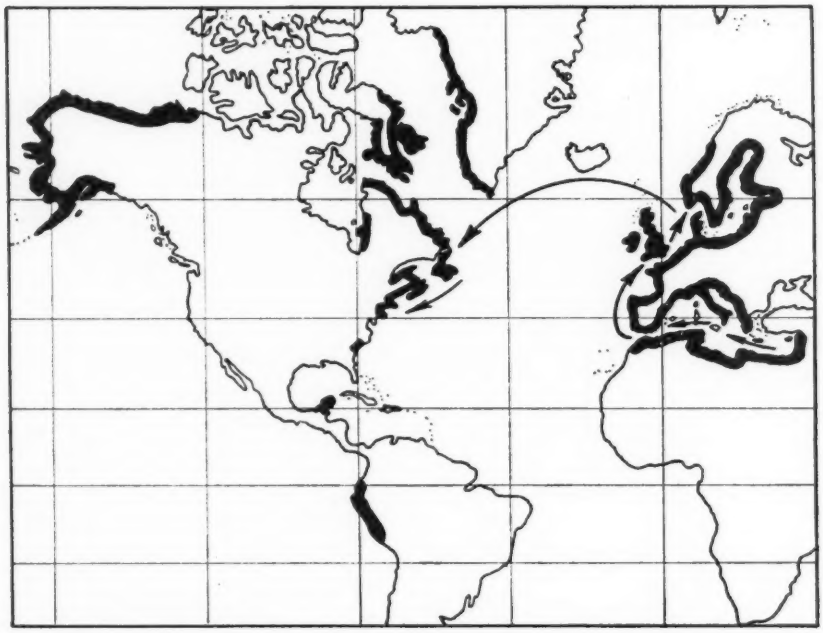


Fig. 34. The distribution of square sails without booms. The square sail without boom first occurs in the Eastern Mediterranean about 1200 B.C. It became the sail of the Phoenicians, the Etruscans, the Greeks, the Carthaginians, and the Romans. It was spread out of the Mediterranean and up the coasts of Europe by some of the later of these people. The Vikings probably spread it to Greenland and eastern North America.

that we can only say it was in the general area of the North Atlantic above Gibraltar.[178] Greek mariners may have pushed into the North Atlantic as far as Lisbon, Portugal, by the end of the sixth century, but this is by no means certain.[179] The Azores were unknown to both the Greeks and

[178] W. W. Hyde, *Ancient Greek Mariners* (New York, 1947), p. 47.
[179] Ibid., p. 120.

the Romans, but they had been discovered by the Phoenicians, for Carthaginian coins have been found on the island of Corvo.[180] In the first century B.C. Roman vessels were making regular trips to Britain. Ships carrying objects of Roman manufacture sailed as far as Iceland.[181]

All these ships from the Mediterranean carried a single square sail without a boom. Similar square sails found in early Ireland, Britain, and Scandinavia can thus be traced to the mariners from the Mediterranean (Fig. 34). The sails of the Vikings are descendants of these sails. It is now accepted that the Vikings did reach North America at various times in the early second millennium A.D. Very probably the aboriginal sails of the northeastern part of North America were copied from Viking sails.[182] The Eskimos of Alaska also had square sails, and Driver and Massey would derive them from Asia, since they are associated with a single type of boat, the *umiak*.[183] I have not determined if any of these Eskimo sails have booms at the foot of the sail. If they do not, they are probably an extension of the eastern North American sails. Square sails are found in Central America, but they are supposed to be copied from European sails.[184] A square sail without a boom is also found in Peru.[185]

As we have already stressed, the aboriginal sails of Asia have booms at the foot, whether they are square or fore-and-aft. This boom originally spread out of Egypt with the square sail. The boom was abandoned on certain Eastern sails, presumably under the influence of Western ships. A striking example of such a change is seen in the sails of Burmese river junks. They have a loose-footed square sail, but it is set on a sheer mast and has multiple lifts to the yard.[186] Both of these last features are typically Egyptian. On the other hand, the sail has a triangular area cut out of the center of the bottom of the sail, just as is seen in many representations of Roman ships. There are also topsails like the Romans used. Therefore we may assume that these Burmese sails lost their booms, modified their sail cut, and added topsails during Roman times in imitation of Graeco-Roman vessels in the Indian Ocean. Likewise in Japan many of the old,

180 Ibid., p. 155.

181 T. C. Lethbridge, *Boats and Boatmen* (London, 1952), p. 133.

182 Norse iron and other objects variously dating from the eleventh to the fourteenth centuries have been found in various parts of Greenland. (H. B. Collins, 'Recent Developments in the Dorset Culture Area,' *American Antiquity*, XVIII [1953], No. 3, Part 2, pp. 33-35.) It cannot be denied that these objects reached Greenland in Norse ships.

183 H. E. Driver and W. C. Massey, *Comparative Studies of North American Indians* (Philadelphia, 1957), pp. 292-294.

184 Ibid.

185 J. Hornell, *Water Transport* (Cambridge: University Press, 1946), p. 42.

186 E. K. Chatterton, *Sailing Ships* (London: Sidgwick & Jackson, Ltd., 1909), p. 8.

tall, square sails had booms, while some did not. We may thus assume that the booms on these sails were abandoned under the influence of the great Western square-rigged sailing ships after 1500.

The fifth period of sail diffusion coincided with the age of the great Hellenistic monarchies and the Roman Empire. The Roman Empire was actually the third great Iron Age empire. The first, the Persian, did not contribute to the development of the sail because the one-masted, square-rigged ship with a single sail was standard during this time. The Hellenistic Greeks apparently invented the small bow-spritsail. During Hellenistic or Roman times Western sailors brought back the spritsail from the Indian Ocean and modified it to the form that is known in Europe today. The ancients of the Eastern Mediterranean during this time invented the short-luff dipping lug and spread it to the western Indian Ocean. The Greeks or Graeco-Romans introduced the *artemon* bow-spritsail to the Indian Ocean where it was used on Indian and Indonesian vessels. The Greeks probably brought back from the Indian Ocean the idea of multiple masts and developed three-masted vessels in the Mediterranean by the third century B.C. During Roman times the one-masted, square-rigged, Roman ship with the small bow-spritsail was the standard rig and was possibly spread to northern Europe by the Romans.

The sixth period of maritime diffusion is associated with the great Arab expansion from the seventh to the tenth or eleventh centuries A.D. The Arabs discovered or developed the triangular lateen in the Eastern Mediterranean and spread it westward over the whole Mediterranean and up the Atlantic coasts of Portugal and Spain. The Arabs are also responsible for the introduction of the two-masted lateen rig with the larger mast forward. In the East Arabs sailed to China with their dipping lugs and left evidence of their journeys in the form of dipping lug sails at the Nicobar Islands. They influenced the Malayan standing lug by making it high-peaked. The Chinese junks of Southern China were also influenced by the Arab sails, and became high-peaked and lost some battens at this time.

The last and greatest period of nautical diffusion started with the Renaissance about A.D. 1450. The start of the Renaissance has often been given as 1453, the fall of Constantinople. However, many scholars deny that the event had anything to do with this remarkable awakening, and prefer a date of 1440, the approximate date of the invention of printing. Certainly the manufacture of printed books gave the development of sails in the West a certain impetus. This can be dated about 1475 for the Low Countries and England.[187] About this time woodcut illustrations became

[187] E. K. Chatterton, *Old Ship Prints* (London: John Lane, 1927), pp. 15-16.

common and were used for around a century until superseded by metal engravings. The leaders of the nautical Renaissance were the Dutch, and they forged ahead by leaps and bounds for about two hundred years, only to stop dead. Today Dutch craft with sails are little changed from those of 1700.[188]

The classic example of the effect of the printed book is shown by Spilbergen's two-masted, leg-of-mutton illustration and how this two-masted rig was first accepted by the Dutch and then spread to England, Bermuda, and America. The introduction to the West of the idea of two equal masts and the leg-of-mutton sail was the most important advancement during this period for the fore-and-after. The two equal (or almost equal) masts of course led to the schooner rig by the addition of a jib. The 'ketch' rig was introduced to northern Europe from the Mediterranean early in the Renaissance. A great development during this period was the full-rigged ship, which consisted of the addition of the various components then known to produce larger and larger vessels with more and more sails. The full-rigged ship became the 'dinosaur' of nautical development. It evolved very fast to a great size, and then had to be abandoned. The European spritsail was in turn spread over the East after 1600 from India to the Polynesian Islands by the English and the Dutch.

The Dutch leeboards first occurred in Holland about 1600, and some have suggested that the Dutch invented them. Again we may assume that they derived the idea from the East. Chatterton has suggested that some traveler brought the idea back from China where they had been used for centuries.[189] It seems that they could have also derived the idea from India, for the canoes of the Palk Strait in South India use two quarter rudders and a single leeboard all of the same long and narrow shape.[190] An Indian origin of the Dutch leeboards might seem to be substantiated by the fact that while generally the Dutch boards were broad in relation to their length, those of Zeland and Frisian are somewhat long and straight like the Indian ones,[191] perhaps preserving the original form.

Another example of the influence of the East is shown by the fact that in 1662 Sir William Petty designed and launched a vessel in England with 'two bottoms, or keels' as she was described.[192] This can only have been a catamaran (double canoe) modeled after some of the Pacific, and is the first record of the construction of such a craft in the West. These have

188 E. K. Chatterton, *Sailing Ships* (London: Sidgwick & Jackson, Ltd., 1909), p. 285.
189 E. K. Chatterton, *Fore and Aft* (Seeley, Service & Co., 1912), pp. 71-73.
190 J. Hornell, *Water Transport* (Cambridge: University Press, 1946), pp. 261-262.
191 E. K. Chatterton, *Fore and Aft* (London: Seeley, Service & Co., 1912), p. 72.
192 Ibid., p. 153.

been built periodically by yachtsmen since that time. In 1876 the famous American designer Nat Herreshoff built one.[193] Since that time many have been built for yachtsmen.[194] Recently many large and small ones have been built in California and Hawaii.

It is interesting to note that the history of the sail shows that development went in spurts and then seemed to stagnate until the next impulse, although minor improvements and natural evolution took place all the time. After Graeco-Roman ships left the Indian Ocean, the rigs of the vessels there remained essentially the same until 1500 when the West again sailed into the Indian Ocean in force. Dutch supremacy and leadership lasted for several centuries, and then marked time as the torch was picked up by America. The final period which started with the Renaissance has seen the end of the story. Man circled the globe with ease under sail and spread various sail forms freely back and forth, until all people had perfected their old rigs in some manner. Finally the age of sail has all but ended. In Europe and the East there is still ample opportunity to study the sail, for the fisherman everywhere in these areas resorts to sail on the smaller craft.

During all this long period of the improvement and the diffusion of the sail lasting some 5,000 years the Dutch shine out in the picture like a full moon on a clear night. But this may be partly due to the fact that the great period of Dutch development is so recent, and to the warm glow left by the great Dutch marine painters, from whom we get so much information. We have now taken most of the nautical inventions formerly attributed to the Dutch away from them. Only the triangular jib remains entirely theirs.[195] Almost everything else is borrowed—the spritsail, the leg-of-mutton sail, leeboards, the boom, the ketch rig. However, the Dutch rapidly improved most of what they borrowed. They changed the spritsail to a gaff sail. Within decades of the adoption of the leg-of-mutton sail they had altered it to the short-gaff sail. They invented the jib. They perfected the schooner rig. They combined these various elements to lead the West in the development of the fore-and-aft rig with many sail elements. Then the spark of energy which made the Dutch lead the world in all this development died out and the mainstream passed to other nations.

193 L. Francis Herreshoff, *Capt. Nat Herreshoff* (New York: Sheridan House, 1953), pp. 77-78.

194 A. C. Brown, *Twin Ships* (Newport News: Mariners' Museum, 1939), pp. 65-71.

195 It had occurred to me that the triangular jib might possibly be borrowed from the triangular 'sails' seen on some types of windmills of the Eastern Mediterranean and Portugal (C. Singer, et al., *A History of Technology* [Oxford: Clarendon Press, 1956], II, 618-619), but the antiquity of mills with jib sails does not seem to be great. Actually, the sails of these windmills were probably copied from triangular jibs or leg-of-mutton sails. Since the jib definitely occurs before the introduction of the leg-of-mutton sail in Holland, it cannot be a leg-of-mutton sail set on a forestay. But on the other hand, the evidence indicates that the leg-of-mutton sail owes nothing to the jib.

The drive seems to have passed to America, so that by the middle of the nineteenth century the Americans were showing the Dutch and the British their wakes in the design and construction of sailing craft.

The Dutch accomplishment is all the more remarkable because they were latecomers to world travel and empire building. The Portuguese navigator Vasco da Gama sailed around the Cape of Good Hope in 1497, but it was not until 1595, almost a hundred years later, that the first Dutch ship rounded the Cape.[196] The Dutch apparently made use of published works of the Spanish and the Portuguese before this time. The really remarkable point about the Dutch is that they did not have any kind of a monopoly on such nautical matters, but took the best of all nations and peoples and incorporated it for their own use. The Spanish and the Portuguese had direct access to the same information, but they never seem to have borrowed any designs from the East. Perhaps it was because they had a fore-and-aft rig—the lateen sail—and it served their purpose. The English likewise had all the information which the Dutch had, and they entered the Eastern Seas about the same time. The Dutch had the spritsail from at least 1420. But they never seemed satisfied with what they had. They tried every new fore-and-aft sail that appeared, and ended by improving on each design in some manner.

It is interesting to note that the invention and subsequent perfection of the fore-and-aft sail is strictly an Iron Age development (Fig. 35). The term 'Iron Age' is used here in a rough time sense, signifying a start of about 1000 B.C. However, it seems that the people who developed the first fore-and-aft sail—the Indonesian spritsail—were probably still in a Bronze Age culture, or perhaps even in a Neolithic status. But their invention was eagerly accepted by the great Iron Age civilizations of the West. The West apparently did not have the fore-and-aft rig (spritsail and dipping lug) until the time of the Roman Empire, or shortly before. The Bronze Age civilizations of Egypt, Mesopotamia, and India never knew anything better than the square sail.

The development of sails is in contrast to hull developments, for man undoubtedly possessed many of the basic forms of hulls before a sail of any kind was thought of. Certainly the dugout, the log raft, and the reed bundle boat were known before the end of the Chalcolithic, and some if not all of these undoubtedly go back at least to Neolithic times in the Near East. The plank-built boat (without frames) was well developed in early Bronze-Age Egypt. We find the same downward spread of all these hull forms to Neolithic people during the time the Near East was in the

[196] R. Coupland, *East Africa and Its Invaders* (Oxford: Clarendon Press, 1938), p. 52.

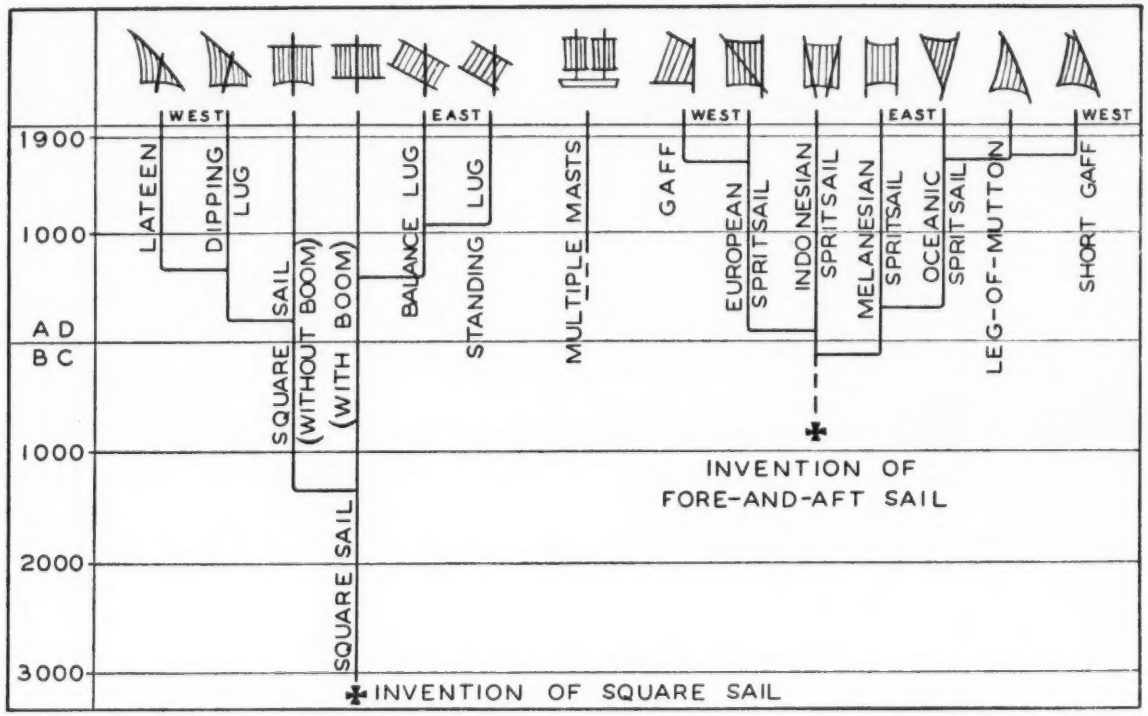


Fig. 35. The origin and development of lug and lateen sails and fore-and-aft sails. There are two great classes of sails, one having the Egyptian square sail with boom as an ancestor, the other having the Indonesian spritsail as an ancestor. The true fore-and-aft sails evolved from this last branch.

Bronze Age. The fact that the Neolithic Polynesians had dugouts or the Eskimos had skin boats does not necessarily mean that these were developed during the Neolithic. It simply shows that primitive man was receptive to ideas which his more civilized neighbors had developed.

In summary we see that the *unified sail theory* presented here shows the following:

1. The spritsail was probably invented in Indonesia and spread to the Indian Ocean where the Greeks may have discovered it and brought it back to the Mediterranean (Fig. 2).

2. The gaff sail was developed by the Dutch from the spritsail, possibly by accident from their way of hoisting the sprit base up the mast (Fig. 6).

3. A gaff sail developed in the Bismarck Archipelago from a rectangular square sail similar to the ancient Egyptian form, presumably under influence of the Dutch gaff sail (Fig. 4).

4. The boom of the European gaff sail was probably brought back from the East.

5. The leg-of-mutton sail was introduced to Holland from Peru, possibly through the Spanish, although the two-masted rig appears to be due to Spilbergen (Fig. 29).

6. The short-gaff sail was developed from the leg-of-mutton sail by the Dutch (Fig. 8).

7. The dipping lug was apparently invented in the Eastern Mediterranean by the Greeks and was also used by the Romans.

8. The dipping lug was probably introduced to the Indian Ocean during either Hellenistic or Roman times and became the sail of the Persians and the Arabs of the Persian Gulf and the Gulf of Oman at an early age (Fig. 17).

9. The triangular lateen was apparently developed in the Eastern Mediterranean and spread westward as far as the Atlantic coast of Spain by the Arabs.

10. The Chinese invented the balance lug with battens.

11. The Malayans invented the standing lug, and the idea was presumably brought back to Europe by the French.

12. The Greeks became the first in the West to use more than one sail when they developed the small *artemon* bow-spritsail.

13. The Greeks probably borrowed the idea of more than one mast

from the multi-masted vessels of the Indian Ocean and developed two- and three-masted vessels.

14. The Arabs undoubtedly introduced the idea of the large forward mast (small mizzen) in two-masted vessels to the Mediterranean (Fig. 30).

15. The idea of two equal masts spread from Polynesia to Peru and was brought back to Europe and spread to America to give rise to a number of rigs with two equal or almost equal masts (Fig. 29).

16. There were seven outstanding periods of sail diffusion.

I. Chalcolithic Age. This started in the Near East with the invention of the square sail about 3000 B.C. in round numbers. The Bronze Age civilizations of the Near East probably had similar basic forms of the square sail.

II. Bronze Age. This was represented by cultures in Mesopotamia and Egypt, but the eastward diffusions were probably initiated by the Indus Civilization from 2500 B.C. to 1500 B.C.

III. Indonesian period. A poorly defined period in the first millenniums B.C. and A.D. wherein the Indonesian spritsail spread westward into the Indian Ocean and Indonesian sail forms spread into the Oceanic Islands (Fig. 33).

IV. Phoenician and Carthaginian periods. During this period the square sail without a boom was spread westward in the Mediterranean and north along the Atlantic coasts of Europe. It was extended by the Romans, and the Vikings probably carried it to Greenland and North America (Fig. 34).

V. Hellenistic and Roman periods. The Hellenistic period is dated from the death of Alexander (323 B.C.) while the Roman era lasted from about 20 B.C. to say A.D. 300 in round numbers in respect to East-West maritime contact.

VI. The Arab expansion. This period ran from about A.D. 700 to around A.D. 1000.

VII. The Nautical Renaissance. This was due mainly to the Dutch, starting about 1450 and lasting to around 1700.

Book Reviews

R. A. SKELTON, *Explorers' Maps: Chapters in the Cartographic Record of Geographical Discovery* (London: Routledge and Kegan Paul, 1958). 7¾″ x 10″, cloth. xi + 337 pages. Colored frontispiece. 219 figures. 63*s*.

No better man than the Superintendent of the Map Room at the British Museum, who is also Honorary Secretary of the Hakluyt Society publications, could be found to write a book of this kind. *Explorers' Maps* is one of those rare volumes, both informative and entertaining, which is a delight to browse through, and a quick and handy reference work. We are indebted to Mr. Michael Huxley, Editor of *The Geographical Magazine* for requesting Mr. Skelton to write the series of articles for him, which now appear as the fourteen chapters of this book. These chapters are grouped into six regional parts. 'The Way to the East' considers Marco Polo and the Portuguese voyages to the Indies. 'The Way of the West' carries the search for Cathay in that direction and the resulting discovery of the New World. 'The Way of the North' is the bitter, courageous, and persistent struggle to find a shortcut to the Far East. 'The Spice Islands and Cathay' is the story of the European rivalry to reach those rich marts. 'The South Sea' covers the early Spanish and Dutch voyages in those waters and the voyages and work of that greatest of all explorers, Captain James Cook. The book closes with a section entitled 'The Continents and the Poles' taking up the nineteenth-century opening up of 'darkest Africa' and the final assault on the Polar regions.

The book is well printed and beautifully illustrated. Readers of geographical literature are constantly plagued by references to maps which the authors know in detail, but of which the reader often has only the haziest notion. With Skelton's book beside him, the reader may now quickly see most maps that are usually referred to. Besides the cartographical illustrations there are also numerous pictures of the sturdy ships that carried the explorers over all the world and made the maps possible.

The author and publisher are to be congratulated and thanked for producing this good, useful book.

ERNEST S. DODGE

Peabody Museum of Salem

J. C. MEREDITH, *The Tattooed Man* (New York: Duell, Sloan and Pearce, 1959). 5½″ x 8¼″. v + 90 pages, illustrated. $3.00.

In 1902 an old man ninety-two years old was living in the Willamette Valley, Washington. His name was Horace Holden, and when he was twenty-one years old, like many other upcountry farm boys, he came from his home town of Hillsborough, New Hampshire, to the busy whaling port of New Bedford. There he shipped on the whaler *Mentor*, which sailed for the Pacific in July 1831. Between that time and

5 May 1835 when he arrived in New York he endured experiences that would satisfy his adventurous spirit for the rest of his lifetime. Shipwrecked in the Palau Islands, he had made an open boat voyage to the tiny island of Tobi or Lord North's Island, as it was then known. He suffered severely at the hands of the natives who forcibly tattooed him. In 1836, with the help of the Rev. John Pickering of Boston, he published a small book describing the adventures and suffering of himself and his shipmates. Mr. Meredith has retold the tale well using all other known sources in addition to Holden's book. Meredith's little volume, which was first published in Denmark a year ago, provides a most enjoyable evening's reading of an authentic case of shipwreck in the South Seas.

MICHAEL LEWIS, *The History of the British Navy* (Fair Lawn, New Jersey: Essential Books, 1959). 5¾" x 8¾", 259 pages.

The author of this short history has managed to cover a large subject in remarkably few pages; a trick all too seldom accomplished nowadays. Furthermore, for the interested general reader, it is covered very well. The book is divided into three parts. The 'Old Navy' covers the period from the navy's birth in Tudor times through the glorious Elizabethan period to the mid-seventeenth century when the ships ceased to be Crown property and became owned by the State. Part II is titled 'The Royal Navy' from 'the name conferred upon it by Charles II, the first King who did *not* own it.' This was the strong, permanent, professional force that ruled the seas and created the British Empire. 'The New Navy' Part II continues the story from about 1800 through World War II and the period of total war. In his short space the author manages to include an occasional amusing story. We learn for instance why the red and blue uniform suggested by the officers to the Duke of Bedford, First Lord of the Admiralty, was not adopted. When it was recommended in 1787 his Grace replied 'No. . . . The King had determined otherwise for, having seen my Duchess riding in the Park in a habit of blue faced with white, the dress took the fancy of His Majesty who has appointed it for the uniform of the Royal Navy.'

GERSHOM BRADFORD, *Yonder is the Sea* (Barre, Massachusetts: Barre Gazette, 1959). 6¼" x 9¼", cloth, XVI+231 pages, 8 illus. by Harold Durand White. $5.50.

Each year the now tenuous connection with the days of square-rigged sailing vessels becomes finer. Few men are left who have had the experience of laying out on a yardarm—who know the ropes, who know the lingo. Gershom Bradford, who writes in a most delightful combination of factual and nostalgic reminiscence, describes his young years on board the old Massachusetts State school ship *Enterprise*.

Beyond this the book is a rambling, entertaining account of seafaring characters the author has met during a salty lifetime, stories he has heard along the waterfront and aboard ship, and his rich experiences in that best of all government offices: the Hydrographic Office. There is a chapter on that rugged old Arctic voyager Captain Bob Bartlett and another on the last real coasting character Captain Parker J. Hall. The stories about Parky Hall are legion. One not included by Bradford concerns a yachtsman who was invited aboard Captain Hall's old coaster one day in Boothbay.

Hall, who stuttered, always sailed alone and on this occasion he had a deckload of lumber. As the two men talked a black cat came over the lumber and dropped down aft. Parky interrupted himself long enough to turn to the cat and say 'Ge-ge-get f-f-for'ard, you black son-of-a-bitch.' The cat turned around and returned to the forecastle.

GLADYS M. O. GOWLLAND, *Master of the Moving Seas: The Life of Captain Peter John Mathieson from his Anecdotes, Manuscripts, Notes, Stories, and Detailed Records* (Flagstaff, Arizona: J. F. Colton & Co., 1959). 7¾″ x 10¼″, cloth. xvi + 304 + XXVIII + 15. $10.00 in United States, $10.50 elsewhere.

This large book is a complete record of a lifetime spent at sea. It is doubtful, in fact, if there is any more detailed account of any other of the late captains of square riggers. Captain Mathieson was born on board his father's ship *Haakon Jarl*, 15 December 1871, while she was lying in the Thames at Gravesend. This was as appropriate a launching as any sailor could wish for and Mathieson seldom left the sea thereafter. After entering seriously upon his career he served successively as third, second, and first mates and in 1905 received his first command, the old Scottish built bark *Antiope*. He continued at sea almost without interruption on sailing ships and through World War II. His end, an all too common one in our time, was a contrast to his life, for he was killed 31 July 1954 in an automobile accident in West Vancouver.

Aside from the interesting historical record of one good man and his ships, this book will be enjoyed by all those who like authentic accounts packed with the minutiae of a sailor's life.

ROBERT GREENHALGH ALBION, *Seaports South of Sahara* (New York: Appleton-Century-Crofts, 1959). 6¼″ x 9½″, cloth. xii + 316 pages. 17 plates, end paper maps. $6.00.

Once more Professor Albion has produced a solid, historical book, combining the story of one of America's most eminent steamship companies with a consideration of the African trade and our national shipping policy. Throughout a large part of the nineteenth century the old Zanzibar trade was a substantial part of the maritime business of Salem. Now with the economic and political eruption of the entire African continent, the old trade appears small indeed, and there is no doubt that in the future it will be enormous. There are eight useful appendices giving details covering United States-African commerce, Farrell Line ships and captains, cargoes, and trade routes. This is a book every maritime historian and steamship enthusiast will want on his shelf.

A. H. WAITE and A. L. TUCKER, Compilers, *Ship's Plans. A Select List from the Collection at The National Maritime Museum* (Greenwich: National Maritime Museum, 1959). 5½″ x 8½″, 74 pages, illus. 5*s*.

At long last students of naval architecture, historians, and ship model builders can begin to taste the rich fare of the British Admiralty plan collection now de-

posited at the National Maritime Museum. The whole collection contains over 25,000 plans of war and merchant vessels dating from 1700 to 1900. Many of these are of 'foreign' vessels, thanks to the Admiralty's practice of taking off the lines of captured and purchased vessels. It is only because of this that the designs of many American vessels have been preserved. Many of these are included in the selections, and it is to be hoped that as the cataloguing proceeds, more will come to light. The plans are competently described and clear instructions for ordering photostats are given. There is a good index.

T. D. MANNING and C. F. WALKER, *British Warship Names* (Cambridge, Maryland: Cornell Maritime Press, 1959). 5½" x 8¾", 498 pages. $7.50.

This useful book contains more information than its title implies. The authors briefly and clearly explain the systems of naming various classifications of British ships from Elizabethan times to the present. The fortunate policy of continuing traditional names has produced many that have brought victory and honor to the British Navy over several centuries.

As it would have made a work of too vast bulk to include every ship ever built for the Royal Navy, the smaller types were omitted. Sloops of the old navy and corvettes of the new are the smallest classes included. Under each name the vessels bearing that name are listed with their type, dates and battle honors. The book itself is as solid as the ships it lists and will be a handy shelf reference for every naval buff for years to come.

Maritime Museum of Canada: Occasional Papers (Halifax).

1. C. H. LITTLE, *The Influence of Sea Power on the Conquest of Canada* (1958).
2. C. H. LITTLE, Editor, *Despatches of Rear-Admiral Sir Charles Hardy 1757-1758 and Vice Admiral Francis Holburne 1757* (1958).
3. C. H. LITTLE, Editor, *Despatches of Vice-Admiral Charles Saunders 1759-1760, The Naval Side of the Capture of Quebec* (1958).
4. C. H. LITTLE, Editor, *Despatches of Rear-Admiral Philip Durell 1758-1759 and Rear-Admiral Lord Colville 1759-1761* (1958).
5. P. H. WATSON, *The Two Hundredth Anniversary of the Halifax Dockyard* (1959).

It is a pleasure to welcome this new series in the growing literary field of maritime history. So far the five occasional papers published by the newly established Maritime Museum of Canada are all on naval subjects. It is to be hoped that future numbers in the series may also include articles and documents on the Canadian merchant marine which has played a large and honorable part in the growth of Canada and the development of shipbuilding.

The new Maritime Museum in Halifax is to be congratulated on beginning a publication program so soon after its establishment.

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Dates in parentheses after the names of vessels indicate either the years of building or of the reference. Dates indicating the year of the reference are printed in italic type. Vessels having compound names are indexed under the initial letter of the *first* word. A list of vessels having compound names, arranged alphabetically by their *last* names, follows the Index.

List of vessels having compound names arranged alphabetically by their last names

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Beauregard, General
Bertram, John
Birch, Harvey
Bragg, General
Cushing, Caleb
Eagle, Golden
England, New
Express, Ocean
Jewell, William
Lawrence, Abbott
Lovell, Colonel
Palmer, N. B.
Panza, Sancho
Perkins, Thomas H.
Polk, General
Price, General
Rebel, Little
Star, Shooting
State, Golden
Sumpter, General
Taylor, Emily
Thompson, General Jeff
Van Dorn, General Earl
Wade, John
Walla, Rajah
Wave, Dashing
Wave, Witch of the
West, Golden
Witch, Sea
Witch, Water

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